# Humanitarian Aid and Natural Disasters: A Study of Selected European Countries

A dissertation submitted in partial fulfilment of the requirements for the degree of Dr. rer. pol.

to the Department of Political and Social Sciences of the Freie Universität Berlin

by

Matteo Garavoglia

Berlin, May 16th, 2012

Supervisor: Univ. - Prof. Dr. Thomas Risse, Freie Universität Berlin

Second examiner: Univ. - Prof. Dr. Dieter Ohr, Freie Universität Berlin

Date of the viva defense: July 12th, 2012

**Table of contents**

**List of illustrations and tables**

**List of acronyms and abbreviations**

ACP: African, Caribbean and Pacific (countries)

AECID: Spanish Agency for International Cooperation and Development

AFD: French Development Agency

AGEA: Agency for Agricultural Disbursements (Italy)

BMZ: Federal Ministry for Economic Cooperation and Development (Germany)

CAP: Consolidated Appeals Process

CBHA: Consortium of British Humanitarian Agencies

CBI: Agency for the Promotion of Imports from Developing Countries (The Netherlands)

CDA: Christian Democratic Party (The Netherlands)

CDU: Christian Democratic Union (Germany)

CELLUR: Emergency Cell (France)

CERF: Central Emergency Response Fund

CFSP: Common Foreign and Security Policy

CHASE: Conflict, Humanitarian and Security Department (United Kingdom)

CHF: Common Humanitarian Fund

CONCORD: European NGO Confederation for Relief and Development

DAC: Development Assistance Committee

DAH: Delegation for Humanitarian Action (France)

DANIDA: Danish International Development Agency

DCI: Development Cooperation Instrument

DED: German Development Service

DFID: Department for International Development (United Kingdom)

DGCS: Directorate-General for Development Cooperation (Italy)

DGES: Directorate-General for European Cooperation (The Netherlands)

DGIS: Directorate-General for Development Cooperation (The Netherlands).

DGPZ: Directorate-General for Political Affairs (The Netherlands)

DMV: Human Rights and Peace Building Department (The Netherlands)

DPDEV: Department for Development Policy (France)

EC: European Commission

ECHO: European Commission's Humanitarian Office

EDF: European Development Fund

EM-DAT: Emergency Events Database

EP: European Parliament

ERF: Emergency Response Fund

EU: European Union

FAO: Food and Agriculture Organisation

FTS: Financial Tracking System

GADP: Directorate General for Global Affairs, Development and Partnerships (France)

GAERC: General Affairs and External Relations Council

GDP: Gross Domestic Product

GHD: Good Humanitarian Donorship

GIZ: Society for International Cooperation (Germany)

GNI: Gross National Income

GTZ: Society for Technical Cooperation (Germany)

HAC: Humanitarian Aid Committee

HDI: Human Development Index

HGIS: Homogenous Budget for International Cooperation (The Netherlands)

IATI: International Aid Transparency Initiative

IBRD: International Bank for Reconstruction and Development

ICRC: International Committee of the Red Cross

IFES: International Foundation for Electoral Systems

IFRC: International Federation of the Red Cross

IHB: International Humanitarian Service (Denmark)

IOM: International Organisation for Migration

KFW: Reconstruction Credit Institute (Germany)

LDCs: Least Developed Countries

MDG: Millennium Development Goal

MFA: Ministry of Foreign Affairs

NCDO: National Committee for International Cooperation (The Netherlands)

NGO: Non-Governmental Organisation

OCHA: Office for the Coordination of Humanitarian Affairs

OCT: Overseas Countries and Territories

ODA: Overseas Development Assistance

OECD: Organisation for Economic Cooperation and Development

OPT: Occupied Palestinian Territories

PSOE: Spanish Socialist Workers Party

SAH: Humanitarian Action Service (France)

SPD: Social Democratic Party (Germany)

THW: Technical Relief Service (Germany)

UN-HABITAT: United Nations Agency for Settlements

UNDG: United Nations Development Group

UNDP: United Nations Development Programme

UNHCR: United Nations High Commission for Refugees

UNHDR: United Nations Development Report

UNHRD: United Nations Humanitarian Response Depot

UNICEF: United Nations Children's Fund

UNIO: United Nations and International Organisations Department (France)

UNRWA: United Nations Relief and Works Agency

VVD: People's Party for Freedom and Democracy (The Netherlands)

WFP: World Food Programme

**Acknowledgements**

A variety of people deserve to be thanked for helping me throughout these years. As my first and second supervisors respectively, Prof. Dr. Thomas Risse and Prof. Dr. Dieter Ohr have provided me with valuable feedback whenever needed and pushed me to challenge assumptions throughout the development of my work. As co-director of the Research College on the Transformative Power of Europe (KFG), Prof. Dr. Tanja A. Börzel provided me with a stimulating research group where to question and to be questioned. As the present and the former directors of the Berlin Graduate School for Transnational Studies (BTS), Prof. Dr. Markus Jachtenfuchs and Prof. Dr. Michael Zürn contributed to bring together under one roof and for my benefit the expertise of the Berlin Free University, the Berlin Social Sciences Centre and Hertie School of Governance. Still within the academic context, my fellow PhD candidates at the BTS and all the research fellows at the KFG as well as the relevant management and administrative teams made my PhD adventure all the more bearable and enjoyable. For the opportunity to undertake my visiting fellowships in Paris and Amsterdam, I am particularly indebted to Prof. Renaud Dehousse at the Institut d'Etudes Politiques and Prof. Rafael Wittek at the University of Groningen respectively. Finally, I am thankful to Arwen Colell, Dorrit De Jong, Eva Lehrmann, Tim Scheerder and Tore Roerbaek for coding data for some of the countries under investigation.

Government officials across Europe have been kind enough to answer my numerous questions. For their support, I am in debt to Mr. Paul Reglinski at the UK Department for International Development, Mr. Stefano Taliani at the Italian Ministry of Foreign Affairs, Mr. Volker Erhard at the Federal Foreign Office of Germany, Ms. Mads Ettrup at the Danish Ministry of Foreign Affairs, Ms. Borja Santos Porras at the Spanish Agency for International Development Cooperation, Mr. Sander Puntman at the Dutch Foreign Ministry and Ms. Martine Gambard at the French Ministry of Foreign Affairs. For what concerns part of my data collection, I am also thankful to Ms. Regina Below and Mr. José Rodriguez Llanes at the Centre for Research on the Epidemiology of Disasters (CRED) of the Catholic University of Louvain (UCL) for giving me access to CRED's International Disasters Database.

Last but certainly not least, I wish to thank family and friends that put up with my mood swings throughout the process. Tobias Berger for challenging my own ideas, Luisa Brenta for helping me remember my vision, Daniel Renz for "teaching me maths", Marco Garavoglia for putting things into perspective and Suzanne Edwards simply for being Suzi. Indeed, many heartfelt thanks to you all.

**Declaration of authenticity**

Unless when clearly stated, this doctoral thesis is the doctoral candidate's own original work. Working papers that investigated issues related to the section on Germany and to the one on the main empirical findings have been published during the writing of the doctoral dissertation in order to gain valuable feedback from fellow academics. When drawing upon other individuals' work, all efforts have been made to correctly acknowledge the sources at all times. Responsibility for eventual omissions, mistakes and inconsistencies rests, of course, solely with the author. This dissertation has not been submitted to any another university or academic institution.

**Abstract**

The aim of this doctoral dissertation is to investigate which factors are most significant in determining the amount of emergency humanitarian assistance that European donor countries provide to third countries struck by a sudden natural disaster. This longitudinal, quantitative and comparative study of seven EU member states, investigates a number of factors that are likely to influence the provision of humanitarian aid for ten natural disasters that took place worldwide between the 1st of January 2000 and the 31st of December 2008. The evidence suggests that the magnitude of a natural disaster and the institutional setup of a donor country's humanitarian mechanism are two key explanatory factors accounting for variation in the extent to which European donor countries are ready to provide emergency humanitarian assistance to disaster-stricken countries.

**Abstrakt**

Das Ziel dieser Doktorarbeit ist es zu untersuchen, welche Faktoren den Betrag beeinflussen, den europäische Geberländer Drittländern zur Verfügung stellen, die von einer unerwarteten Naturkatastrophe heimgesucht werden. Diese longitudinale, quantitative und vergleichende Studie von sieben EU Mitgliedsstaaten untersucht welche Faktoren die Bereitstellung von Not - und Katastrophehilfe in zehn Naturkatastrophen, die sich zwischen dem 01.01.2000 und dem 31.12.2008 ereignet haben, beeinflussen. Das Ergebnis der Untersuchung zeigt, dass das Ausmaß der Katastrophe und die humanitären Mechanismen der Geberländer zwei entscheidende Faktoren sind, die das Ausmaß an europäischer Nothilfe für von Naturkatastrophen heimgesuchte Drittländer entscheidend beeinflussen.

## 1. Introduction

The tsunami that struck most of South East Asia and the Indian Ocean on the 26th of December 2004 brought to the attention of the general public in Europe and beyond the plight that natural catastrophes can represent for economically least developed countries worldwide. Indeed, the humanitarian response collectively provided by European governments on the occasion of the tsunami was unprecedented in terms of its scale, speed and financial commitment. However, unlike in the case of the tsunami of the 26th of December 2004, the victims of many humanitarian disasters that take place worldwide every year cannot count on an even remotely similar response and commitment on behalf of European governments. Why is that the case? Why do European governments seem to be world leaders in providing humanitarian assistance to the victims of some natural disasters while at the same time completely ignoring the needs of those that have survived other catastrophes? What determines the extent to which European governments are ready to provide emergency financial assistance to the victims of a humanitarian crisis? This dissertation wishes to address these fundamental questions.

The wish to investigate which factors are most likely to influence the extent to which national governments provide humanitarian assistance arises out of the frustration generated by the presence of only a limited amount of research and empirical evidence available on the subject. Indeed, while a significant amount of literature has over the years investigated which factors are most likely to determine development aid flows between most and least economically developed countries, no comparable amount of research has been made available on the subject of short-term humanitarian assistance. A state of affairs all the more surprising in a context whereby European Union member states increasingly strive to integrate and coordinate their humanitarian aid policies. It is therefore felt that academics, policy-makers, practitioners and interest groups alike, might have an interest to be provided with a better understanding of the dynamics that are most likely to influence humanitarian aid flows from European countries to economically less developed ones.

While limiting its research to major natural disasters that have taken place within the first decade of the 21st century, this dissertation develops and investigates three major research hypotheses that might hold an explanatory value and account for variation in disbursements of humanitarian assistance to disaster-stricken countries. A first hypothesis sees the domestic politics that take place within individual donor countries as the key explanatory factor for different performances in terms of the provision of humanitarian aid. A second hypothesis

focuses on the magnitude of a natural disaster under investigation as the factor that is most likely to drive donor countries to release more or less significant amounts of financial assistance. Finally, a third hypothesis revolves around the idea that the institutional setup of each donor country's humanitarian mechanism is the main reasons accounting for a government's performance in terms of its provision of humanitarian assistance.

The empirical data obtained as result of the analysis carried out for this dissertation, refute the first hypothesis while confirming the second and the third ones. Indeed, while domestic politics seem to play virtually no role in determining disbursements of emergency financial assistance, the evidence suggests that the magnitude of a disaster and a donor country's humanitarian mechanism are both significant in influencing the provision of humanitarian assistance following the onset of a sudden natural disaster. Furthermore and aside from disproving the first hypothesis and confirming the second and the third ones, this dissertation also presents a number of observations that might provide interesting insights for further research.

This dissertation is divided into five major chapters: a introductory chapter, a chapter dedicated to the analytical framework and the research methodology, a third chapter exploring the natural disasters under investigation, a fourth chapter presenting the empirical results and, finally, a concluding chapter. The introductory chapter begins by presenting the research question informing the whole dissertation. As a next step, this chapter introduces the original contribution and the added value of this work. Following up on that, the next section highlights the three research hypotheses that are being investigated. After having done that, the introduction moves on to briefly highlight the scope and the limitations of the dissertation. Finally, the last section of this chapter makes sure to introduce the key empirical findings. The second chapter of the dissertation is dedicated to the analytical framework and the research methodology. As a first step, this chapter presents the relevant literature and the theoretical background for the dissertation's dependent and independent variables. Following up on that, the second part of this chapter presents, operationalizes and provides the data sources for each identified variable. As a third step, the third part of this chapter introduces the period of analysis and the seven case studies under investigation. Finally, the last part of this chapter presents the research methodology by describing in detail the practical steps that have been taken in order to carry out the data analysis for the dissertation. The third chapter of this dissertation explores the natural disasters under investigation. In order to do so, ten sections (i.e. one for each natural disaster) individually present the key characteristics of the

humanitarian catastrophe in question. Following up on that, an eleventh section contrasts the ten natural disasters under investigation in comparative terms. The fourth chapter of the dissertation introduces the empirical results. While the first part of this chapter presents the results for all donor countries combined, the rest of the chapter provides individual results for each donor country. In this respect, the seven parts dedicated to the individual donor countries are each divided into two sections: one focussing on the quantitative analysis of two research hypotheses and one concentrating on the qualitative investigation of the third research hypothesis. Finally, the last chapter of this dissertation presents some overarching conclusions. Within this framework, the first part of the conclusion specifically focuses on summarising the empirical findings for each one of the three research hypotheses under investigation. Following up on that, the second part of the conclusion concentrates on those areas that have been identified for further research.

### 1.1. Research question

The aim of this dissertation is to explore which factors are most likely to influence the provision of humanitarian assistance on behalf of seven European donor countries. More specifically, this dissertation investigates whether and eventually to what extent the commitment of a national government to the provision of humanitarian aid to disaster-stricken countries is correlated with the degree to which certain explanatory factors might be in place. The issue area covered by the dissertation is therefore humanitarian aid and its focus is on the extent to which domestic politics, the magnitude of a humanitarian disaster and the institutional make up of a donor's humanitarian mechanism impact upon policy-making. Within such an understanding, the amount of humanitarian aid provided by national governments constitutes the Dependent Variable (DV) while domestic politics, the magnitude of the disaster in question and the donor's humanitarian profile make up the key Independent Variables (IVs).

### 1.2. Original contribution and added value

This dissertation does not limit itself to test an established theory but, rather, it aims to test three hypotheses in relation to a specific issue area through the investigation of a number of case studies. More specifically, the original contribution and added value of this dissertation is three-fold. First of all, this dissertation contributes to fill a gap in the literature by exploring the key determinants of emergency humanitarian assistance so as to complement the up to now much more investigated determinants of long-term development aid. Secondly, this

dissertation provides a coherent comparative framework to observe eventual similarities and common trends in the policy decision patterns of different European Union member states. Finally, this dissertation provides valuable insights for those socio-political actors that aim to influence the humanitarian aid policies of the seven EU donor countries under investigation.

To begin with, an added value of this dissertation is to be found in its contribution to the literature that focuses on those factors that are pivotal in determining a donor country's decision to provide humanitarian aid to disaster-stricken countries. Indeed, by collecting new evidence on the key determinants of humanitarian aid flows, this dissertation aims to fill a gap in the current literature whereby most academic work has so far focused on development aid while only marginally exploring humanitarian aid patterns. More specifically, this dissertation will therefore look at a number of independent variables pertaining to a donor country's domestic politics, at the magnitude of a humanitarian catastrophe and at the donor country's humanitarian mechanisms as explanatory factors accounting for the donor's performance in terms of humanitarian aid provision of selected EU member states.

Secondly, this dissertation highlights the emergence of pan-European trends in the provision of emergency humanitarian assistance. Indeed, because data is collected and presented in a coherent and comparable manner, this dissertation provides the opportunity to observe whether different European member states might actually be acting in a similar fashion in terms of their aid disbursements. While European Union member states still retain control over their humanitarian budgets, the European Commission Humanitarian Office (ECHO) has since its inception in 1992 played an ever more significant coordinating and leading role within European humanitarian policy. It is therefore reasonable to expect that, while officially maintaining complete sovereignty over their humanitarian policies, European Union member states might be developing common disbursement patterns. A trend, that might even highlight similarities for what concerns the role played by domestic factors in shaping their respective decision-making processes.

Finally, the research carried out for this dissertation and its three working hypotheses provides an additional framework of reference for the action of selected socio-political actors that wish to influence the humanitarian aid policies of the selected donor countries. Indeed, the question of whether there exists a correlation between the presence of selected domestic political conditions and greater commitment on behalf of national governments to the provision of emergency humanitarian assistance is extremely important for transnational advocacy groups, practitioners and Non-Governmental Organisations (NGOs). If a strong positive correlation

between selected indicators and the provision of humanitarian assistance is established, non-state socio-political actors are provided with useful data to decide when and where to attempt influencing governmental policy-making. Additionally, these actors are provided with a framework of reference to observe when national governments are more or less responsive to specific political conditions and can therefore make better use of their limited human and financial resources. These considerations are all the more relevant for those transnational socio-political actors that operate across different member states of the European Union.

### 1.3. Research hypotheses

In the context mentioned above, three general hypotheses are developed. The first hypothesis sees domestic politics as the key factor determining the extent to which a donor country chooses to provide humanitarian assistance. The second hypothesis centres on the idea that the magnitude of a humanitarian disaster is the driving force behind a donor country's decision to release a certain amount of humanitarian aid. Finally, the third hypothesis revolves around the understanding that the nature of a donor country's humanitarian mechanism is key in accounting for the extent to which humanitarian assistance is provided. The general argument of this dissertation is that different dynamics might contribute to explain the extent of humanitarian aid provided by donors to countries that have been struck by a humanitarian catastrophe. Within this context, an explanation that would centre on domestic politics as the key factor influencing humanitarian policy-making would privilege a focus on issues such as a donor country's economic growth, the permanence in government of a centre-left or a centre-right coalition, the presence or not of an electoral period and the extent to which a natural disaster might have been reported in the donor country's national media. On the other hand, an explanation that were to privilege a more "ethical" approach to policy-making would claim that a donor country is likely to determine its provision of humanitarian assistance primarily in light of the magnitude of the natural disaster that a recipient country finds itself to face. In this case, issues such as the number of days that have elapsed since the onset of a disaster, the number of fatalities recorded, the total number of people affected and the extent of the estimated damages caused by the disaster would be particularly significant in determining a donor country's provision of aid. Finally, a more historical-institutional explanation would place the institutional setup of the humanitarian mechanism of the donor country under investigation at the centre of its analysis. In this case, the perceived effectiveness of a country's humanitarian policy would be investigated by looking at the extent to which a country engages with the international humanitarian community, by

observing the total amount of resources dedicated to the provision of humanitarian assistance to the disaster-stricken countries under investigation as a percentage of the donor's GNI, by exploring the degree of operational independence that a donor's humanitarian agency can claim from political influence and by the administrative capacity displayed by the government department tasked with providing humanitarian assistance.

### 1.4. Scope of the dissertation

The three hypotheses presented above constitute alternative explanations accounting for which factors might be most significant in determining variation in the extent to which donor countries are ready to provide humanitarian assistance following a natural disaster. Indeed, these alternative explanations are of a more strictly "political nature" in the case of the first hypothesis, of a rather "moral nature" in the case of the second hypothesis and, finally, of a more "institutional nature" in the case of the third hypothesis. Having said that, all these three alternative explanations can be properly assessed only within the limits of certain scope conditions and, in this respect, a number of observations shall be made. To begin with, this dissertation limits its pool of donor governments under investigation to member states of the European Union. This is done because, while acknowledging the importance of ensuring a high degree of variation in the dependent variable and among donor countries, it is deemed fundamental to deal with a comparable set of case studies that could reasonably be expected to share some basic socio-political and economic macro-characteristics. Secondly, this dissertation limits itself to explore bilateral government-to-government humanitarian aid flows. It does not, therefore, take into account private donations by individuals or companies nor emergency financial assistance provided by international or supranational organisations. Such a choice is dictated by the fact that, unlike in the case of bilateral government disbursements, data on individual donations and private humanitarian aid flows is unreliable at best. Finally, this dissertation confines its analysis to domestic independent variables. It is therefore beyond the scope of this dissertation to provide an analysis of all foreign policy factors that might influence the provision of humanitarian assistance on behalf of a donor country. Rather, this dissertation limits itself to provide a number of relevant observations on the geopolitical and strategic context that might affect a donor country's provision of humanitarian assistance for each natural disaster under investigation.

### 1.5. Key empirical findings

The findings of this dissertation confirm the hypothesis focussing on the role played by the magnitude of a disaster and the one concentrating on a donor country's humanitarian mechanism. Unlike the two hypotheses mentioned above, the role played by domestic politics in influencing disbursements of humanitarian assistance appears to be much more limited and confined to specific instances and case studies. While the conclusion of this dissertation presents in more detail the key empirical results and also suggests some areas for future research that have emerged as result of this work, the paragraphs below limit themselves to introduce the main findings of the dissertation for the three research hypotheses under investigation.

To begin with and in relation to the hypothesis revolving around the understanding that the magnitude of a selected disaster accounts for the provision of humanitarian assistance on behalf of donor countries, two key findings shall be highlighted. On the one hand, the number of fatalities recorded for a natural disaster is the single most significant independent variable affecting the amount of humanitarian aid provided to disaster-stricken countries. Indeed, this variable is highly significant for both all countries combined as well as for four out of the seven countries under investigation. It can therefore be claimed that, the greater the number of fatalities recorded for a sudden humanitarian catastrophe, the greater the amount of emergency financial assistance that a donor government is likely to provide to a country struck by a natural disaster. On the other hand, the number of days that has elapsed since the onset of a natural disaster is also significant. In this respect, results obtained for all countries combined as well as for two individual case studies show that there exists a strong negative correlation between the number of days that have elapsed since the onset of a natural disaster and the amount of emergency financial assistance provided by donor countries. It can therefore be claimed that, the greater the number of days that have elapsed since the onset of a catastrophe, the smaller the amount of emergency financial assistance that is likely to be disbursed by a donor government to a disaster-stricken country. While the significance that the number of fatalities recorded and the number of days elapsed since the onset of a natural disaster play in influencing the provision of humanitarian assistance is well documented by a variety of case studies, the extent of the influence exercised on the provision of humanitarian aid by the estimated damages caused by a natural disaster is identified as significant in one case study only. Finally, the total estimated number of people that have been affected (i.e.

injured, displaced or having lost their livelihoods) by a natural disaster is not identified as a significant independent variable in any of the case studies under investigation.

Shifting one's focus to the qualitative analysis carried out in relation to the hypothesis that concentrates on the humanitarian mechanism of a donor country as the key determinant of humanitarian aid flows, a number of observations can be made. To begin with, the evidence suggests that those countries whose humanitarian mechanisms are most deeply engaged with the international humanitarian community are also the ones most likely to provide the greatest percentage of their respective Gross National Incomes (GNIs) for the provision of emergency financial assistance to disaster-stricken countries. Secondly, the data available indicates that those countries that are more likely to expend significant financial resources for the provision of long-term Overseas Development Assistance (ODA) are also the ones most likely to provide the greatest amounts of emergency humanitarian assistance as a percentage of their respective GNIs. Thirdly, the evidence implies that those countries whose humanitarian agencies are most likely to be operationally free of undue political pressure are the ones most likely to dedicate the greatest percentage of their respective GNIs to the provision of emergency humanitarian assistance to disaster-stricken countries. Finally, the information available suggests that those countries whose humanitarian agencies display the most developed administrative capacity are also likely to be the countries whose governments are ready to dedicate the most significant percentage of their GNIs to the provision of humanitarian assistance.

Finally and in terms of the variables that quantitatively explore the hypothesis according to which domestic politics plays a fundamental role in influencing humanitarian disbursements, three basic considerations shall be made. To begin with, the analysis carried out for all countries combined highlights a strong negative correlation between the size of a donor country's Gross Domestic Product (GDP) and the dependent variable. This result is surprising in that it would seem to suggest that, as a donor country's GDP grows over time, the amount of emergency financial assistance that this is likely to provide to disaster-stricken countries decreases. Having said that, a number of statistical considerations and an analysis of the individual case studies suggest that a donor country's GDP product is not a significant variable affecting the disbursement of humanitarian assistance. Secondly, the total number of articles published on a humanitarian crisis seems to be an independent variable that significantly affects the dependent variable in one case study only. Indeed, the Multiple Regression Analysis (MRA) carried out for all countries combined does not identify media

coverage as a significant variable. Last but not least, the political orientation of the largest party in government in a donor country and whether or not a donor country finds itself in the midst of an electoral period do not constitute significant independent variables.

## 2. Analytical framework and research methodology

This chapter of the dissertation aims to present the analytical framework and the research methodology employed in order to achieve the objectives set out in the introduction. In order to do so, this chapter begins by illustrating the relevant literature and the theoretical background underpinning the research project's dependent and independent variables. As a second step, this chapter moves on to present, operationalize and introduce the data sources for the key dependent variable and for each one of the relevant independent variables. After having done that, the third part of this chapter presents the period of analysis and the seven case studies that have been selected. Finally, the fourth part of this chapter concentrates on the research methodology by relaying in detail the individual steps that have been taken in order to carry out the quantitative and the qualitative analyses.

### 2.1. Review of the literature and theoretical background

This first part of the analytical framework and research methodology provides an insight into the relevant literature and the theoretical background that inform both the dependent variable and the selected independent variables. Indeed, the first section provides an insight in the literature that informs the theoretical background for the variables under investigation. The following three sections present the theoretical background for the independent variables by introducing them within the framework provided by each one of the three research hypotheses.

#### 2.1.1. Review of the literature

While a relatively limited amount of literature has been generated over the years on the determinants of humanitarian aid policy-making and European humanitarian aid patterns, significantly more literature is available on the overarching trends of European development flows and on those factors most likely to influence them. A brief review of the relevant literature is therefore necessary in order to contextualise the intellectual space within which this dissertation develops its analysis of the determinants of humanitarian assistance.

A number of studies have over the years attempted to determine what key factors are most significant in influencing donor countries' development and humanitarian aid policies. Lumsdaine, for instance, seeks explanations for humanitarian aid and shows that the amount of assistance and its chosen recipients seem to be determined by the recipient's income levels, by its democratic credentials and the colonial history linking the recipient to the donor. Still,

Lumsdaine also claims that there is a "moral vision" pushing donor countries to provide development assistance to less economically developed nations and that this "moral vision" is indeed a powerful determinant of aid flows (Lumsdaine 1993). Lumsdaine's point of view has been strongly opposed by those, such as Maizels and Nissanke, who identify the donor's strategic interests as the primary determinant for the direction and the quality of aid flows (Maizels and Nissanke 1984). On a similar note, Schraeder, Hook and Taylor claim that more traditional "power politics" and long-term geostrategic interests are the key determinants of the quantity and the quality of Overseas Development Assistance (ODA) provided by Development Assistance Committee (DAC) countries (Schraeder, Hook and Taylor 1998). While according to different studies Sweden is the country that comes closer to subscribe to Lumsdaine's "moral vision" (Karre and Svensson 1989; Pratt 1990), data gathered over the years points also to more "traditional" geostrategic reasons as key determinants of aid flows. Indeed, a number of studies conducted on the determinants of aid flows from France (Grosser 1975; Hayter 1966; Kolodziej 1974), the United States (Hook and Spanier 1998; Schraeder 1992) and Japan (Hasegawa 1975; Nester 1992; Scalapino 1992; Stirling 1981) have consistently shown that, for what concerns their development and humanitarian aid choices, these countries have traditionally been moved by cultural-economic, geostrategic and business-related interests respectively. More recently, the above-mentioned literature has been joined by new research focussing on the role played by the mass media in influencing long-term development aid flows (as opposed to the short-term humanitarian aid flows investigated by this dissertation). Within this context, work carried out by Lim, Barnett and Kim (Lim, Barnett and Kim 2006) and Van Belle and Potter (Potter and Van Belle 2004; Van Belle 2003) have all highlighted that, while geostrategic interests still remain an important determinant of countries' development policies, the media clearly play a remarkably important role in the process of political agenda-setting and are a key determinant in shaping development aid flows. While such evidence has been collected primarily in relation to long-term development assistance, this dissertation wishes to contribute, among other things, to expand the current body of literature so as to also explore the key determinants of the provision of short-term humanitarian assistance.

This dissertation develops three general hypotheses in order to account for the extent of the provision of emergency humanitarian assistance provided on behalf of European governments to disaster-stricken countries. A first hypothesis sees domestic politics as the driving force of this process. A second hypothesis argues that the magnitude of a natural disaster is most likely to account for disbursements of humanitarian assistance. Finally, a third hypothesis suggests

that the administrative capacity and the nature of each donor country's humanitarian mechanism are key in understanding a government's likelihood to effectively provide humanitarian assistance. What all these three hypotheses have in common is an understanding that domestic dynamics are key in explaining variation in foreign policy-making. Such an understanding is probably the single most fundamental tenant of liberal theory and, because of that, liberal theory is the key meta-theory informing the theoretical background of this dissertation.

Within international relations theory, the role that domestic politics play in determining actors' preferences and state action is intimately intertwined with liberalism. Indeed, liberal theory gives analytical primacy to societal actors and to state preferences that emerge as result of the interaction between different socio-political actors within the state. Liberal theory develops its analytical framework through a number of steps. To begin with, an analysis of the preferences of specific domestic groups takes place. Secondly, an investigation of sectorial interests aims to determine winners and losers of liberal political processes. As a next step, the nature of political aggregation (representation) highlights the structure of domestic intermediation. Finally, the interest that "conquers" the state is analysed in terms of the projection of its preferences on the international scenario through the international policies of the state. Within this context, there exist at least three fundamental assumptions upon which liberal IR theory is based: primacy of societal actors, representation of state preferences and interdependence within the international system (Moravcsik 1997). More specifically, the first assumption revolves on the understanding that generally risk-averse and rational private groups and individuals collectively organise themselves in order to promote their interests within a context characterised by legal, material and ideological constraints. The second assumption, on the other hand, centres upon the idea that the state represents only the preferences of certain actors and that these, once re-defined as state preferences, are promoted by the state on the international scenario. Finally, the third assumption claims that the interdependent preferences of states determine in turn state behaviour. As a general theory focussing on the role played by domestic dynamics in determining state action, liberalism is therefore particularly well suited to account for changes in policy-making over an extended period of analysis as it is done in this dissertation.

If relatively recently Andrew Moravcsik has clearly identified the underlying assumptions upon which liberal theory has to rest, the development of this meta-theory of international relations can be traced back to the age of the enlightenment and, following the devastation of

the Second World War, to both European and North American scholars. Within this context, while Karl Deutsch and Ernst Haas had already focussed their research on the role played by political and economic actors in the process of European integration in the 1950s (Deutsch 1957; Haas 1958), James Rosenau was one of the first scholars to explore the linkages between domestic politics and state behaviour on the international scene (Rosenau 1969, 1973). In the years to follow, both Krasner and Katzenstein would have become strong advocates of the role played by domestic politics in shaping states' international behaviour. Indeed, while Krasner highlighted the simultaneous concerns that the state faced when having to address both domestic and international pressures (Krasner 1978), Katzenstein reiterated the concept by stressing that "the main purpose of all strategies of foreign economic policy is to make domestic policies compatible with the international political economy" (Katzenstein 1976). A decade later, Putnam had clearly and unequivocally argued in favour of a renewed focus on a variety of aspects of domestic politics as co-determinants of foreign policy-making: "A more adequate account of the domestic determinant of foreign policy and international relations must stress *politics*: parties, social classes, interest groups (both economic and noneconomic), legislators, and even public opinion and elections, not simply executive officials and institutional arrangements" (Putnam 1988). So convinced of such a statement was Putnam, that he developed his theory of the logic of two-level games: one that aims to account for the contemporary need for the state to address the pressures arising from both domestic and international constituencies (Putnam 1988). It was soon after, in his "Myths of Empire", that even Jack Snyder quickly built up on Putnam's work by providing empirical evidence on the impact that domestic politics can have on states' foreign policies (Snyder 1991). Indeed, through a historical perspective spanning the entire 20$^{th}$ century, Snyder selected a number of case studies to stress how domestic politics could explain foreign policy-making for Victorian Britain, imperial Germany, pre-World War Two Japan, the Soviet Union and the United States throughout the Cold War. Throughout his research, Snyder highlighted how foreign policy decisions can be systematically re-conduced to coalition politics and to the impact that the parochial interests of specific constituencies could have on these. Only a couple of years following Snyder, Andrew Moravcsik took pains to stress how domestic politics, intended as the key level of analysis for international relations theory, could actually be divided in at least three fundamental sub-categories: society-centered, state-society relations and state-centered theories. According to this distinction, society-centered theory focuses its analysis on domestic pressures arising from social groups through elections, public opinion, the media and legislatures. State-society relations theory, on

the other hand, looks at patterns of education, representation and identity between society and the state as absolutely key in influencing domestic and, in turn, foreign policy. Finally, state-centered theory places at the centre of its research the role that the bureaucratic, administrative and executive apparatus of the state can have in influencing foreign policy decision-making (Moravcsik 1993). Moravcsik's three levels of analysis for the interpretation of domestic politics as determinants of foreign policy are therefore presented here as the theoretical backgrounds employed for the investigation of the dissertation's three research hypotheses.

### 2.1.2. Society-centered theory for the "domestic politics" hypothesis

A society-centered perspective of domestic politics is what informs the first research hypothesis of this dissertation: one that sees the interaction between domestic socio-political groups as the basis of its analysis. According to society-centered theory, the dynamic interplay between a country's social groups is vital in understanding its policy-making. More specifically, this hypothesis revolves around the understanding that a donor country's domestic politics can be characterised by a state of affairs that is more or less conducive to the provision of humanitarian assistance to the victims of a sudden natural disaster. First to be investigated, society-centered theories of domestic politics are characterised by a number of fundamental features. Prominent among these are the downplaying of the role of formal authority and hierarchy, the presence of contemporary horizontal and polycentric interactions and the diminishing significance of the state in organising societal interaction vis-à-vis the key role played by non-state actors and private interests. To begin with, society-centered theory tends to downplay the role that organised hierarchical structures and the exercise of formal authority play in regulating domestic politics and societal interaction. A point, this one, widely acknowledges by Marteen Hajer in his work on network-based societies (Hajer 2003). Secondly, society-centered theory places a great deal of emphasis on the horizontal polycentric interactions of non-state socio-political actors vying for supremacy within the domestic political framework. In this light, both Sorensen and Torfing argue that contemporary interdependence and negotiation with multiple socio-political actors are increasingly replacing centralised state authority with more polycentric governance systems (Sorensen 2002; Torfing 2005). Finally, some society-centered theorists argue that the state is increasingly less relevant as a unit of analysis in order to understand both domestic political processes and their projection in the realm of international relations. It is within such an understanding that Stoker and Salamon go as far as claiming that we are witnessing a

fundamental paradigm shift and historical break whereby new political process dominated by the interplay between fragmented societal interests have largely displaced the state as the primary regulator of societal interaction (Stoker 1998; Salamon 2002). Applied to a hypothesis that identifies in domestic socio-political interaction the key dynamics according to which national governments might be prompted to disburse humanitarian assistance, society-centred theory would expect therefore a state to disburse more or less humanitarian aid depending on whether or not the donor country in question might be in the midst of an electoral period, on the extent to which it has already been able to satisfy its own citizens' basic material needs, depending on which political forces control the government and according to the degree to which issue salience can encourage societal mobilization on a selected topic.

### 2.1.3. State-society relation theory for the "disaster's magnitude" hypothesis

Unlike in the case of society-centered theorists, scholars that subscribe to state-society relation theory focus their analysis on the relationship between societal values, ideas and principles on the one hand, and the expression, representation and "operationalization" of these by the state on the other. According to state-society relation theory, therefore, the state has to "represent and implement" the dominant values held by its society. An understanding of foreign policy-making based on state-society relation theory informs therefore the second hypothesis of this dissertation: one where donor countries are compelled to provide humanitarian assistance by deeply rooted ethical values of human compassion. In his seminal book on "political theory and the modern state", David Held subscribed to such an understanding (Held 1989) and built up on work carried out by Joel Migdal in the context of economically least developed countries (Migdal 1988). More recently, state-society relation theory has informed the theoretical framework of works by John Keane with particular reference to civil society-state relations in democratic processes (Keane 1998, 2003, 2009), and, broadly in the context of north-south relations, by Sudipta Kaviraj (Kaviraj 1999, 2001). Within the field of international relations, David Lumsdaine has become a champion of the understanding that moral values play a significant role in determining policy-making. Most notably, in his seminal book on 'the moral vision in international politics', Lumsdaine claims that domestic actors can be driven by the power of ideas and their moral values when attempting to influence or frame foreign policy decisions. Indeed, Lumsdaine goes as far as claiming "how states act often reflects the values and principles they hold" (Lumsdaine 1993). Since having laid the basis of its "moral vision" in state-society relation theory, Lumsdaine's

work has then been carried forward by others scholars such as Hattori, Schopf, Nockerts and Van Arsdale (Hattori 2003; Schopf 2007; Nockerts and Van Arsdale 2008). An analysis of their works presents an understanding of state-society relation theory based on ethical notions that rests on three fundamental assumptions: a specific understanding of human nature, the existence of moral obligations rooted in historical practice and the presence of a vibrant civil society that can transmit its values to the state apparatus. To begin with, Lumsdaine proposes a view of human nature that is more holistic than the one offered by realist scholars for whom human nature is overwhelmingly egoist, self-centred, destructive and power seeking. Indeed, while acknowledging that human nature is characterised *also* by these traits, Lumsdaine argues in favour of a much more nuanced picture whereby "human beings are a mixture of self-interest, idealism and pointless destructiveness. All three elements operate, in varying proportions, in civil society and politics, and in international affairs as well as in the life of the individual" (Lumsdaine 1993). Far from being naïve about human nature and clearly observing its worst traits, Lumsdaine nevertheless claims that *all* characteristics of human nature, therefore including positive ones, shall be taken into account to understand societal interaction. Secondly, society-state relation theory stresses the significance of moral and ethical imperatives in influencing state behaviour. Within such understanding, an ideal historical development that ranges from Aristotelian virtue ethics to modern human rights law provides the ideational background for today's "moral vision in international politics" (Lumsdaine 1993). Indeed, it is with reference to such a historical-cultural dimension that Hattori, Nockerts and Van Arsdale explain current humanitarian practice (Hattori 2003; Nockerts and Van Arsdale 2008). Finally, the presence and analysis of a flourishing civil society capable of transmitting societal values to the administrative echelons of the state apparatus is also seen as pivotal to a sophisticated understanding of state-society relation theory. Such a view was clearly expressed by Lumsdaine himself in his seminar work on the "moral vision" (Lumsdaine 1993) and later again confirmed by further empirical studies such as the one that he carried out with Schopf on South Korean development assistance (Lumsdaine and Schopf 2007). Applied to a hypothesis that finds in the magnitude of a natural disaster the guiding principle according to which a national government should be prompted to provide humanitarian assistance, state-society relation theory would expect a state to provide humanitarian aid so as to give tangible substance to societal values that call for its government's action to alleviate suffering in the recipient country. State-society relation theory would therefore expect for features such as the number of fatalities, the number of affected people, the estimated damages and the time that has elapsed since the

onset of a disaster to influence the extent to which a national government is ready to provide emergency humanitarian assistance to the victims of a sudden natural disaster.

### 2.1.4. State-centered theory for the "humanitarian mechanism" hypothesis

Unlike society-centered and state-society relation theories, state-centered theories of international relations focus on the state, its institutions and its *modus operandi* as the key unit of analysis to investigate foreign policy dynamics. From the perspective of state-centered theory, the study of societal dynamics and the values existing within the state take a backseat compared to the formal institutions and operating mechanisms of the state. An institutionalist analysis of foreign policy-making informs therefore the theoretical background of the third and final research hypothesis of this dissertation: one that sees the state and its administrative and institutional structures as fundamental determinants of foreign policy decisions. More specifically in relation to the dependent variable investigated in this dissertation, this hypothesis sees an effective, well-financed, independent and streamlined national humanitarian mechanism as one most conducive to provide significant amounts of humanitarian assistance to disaster-stricken countries. Within this understanding, a number of fundamental assumptions can be identified. Keys among these are the treatment of the state as a rather unitary actor relatively insulated by socio-political groups, a focus on formal institutions and their operating mechanisms and the understanding of the state as the dominant actor also within those governance processes where non-state actors have been involved. To begin with and as the "mother" of all theories of international relations, realist theory firmly places the state at the centre of its analysis in order to account for the dynamics of the international scenario. This is seen as a rather rational and unitary actor that seeks its security while constantly dealing with international power relations. A point this one, repeatedly made by venerable scholars such as Morgenthau, Waltz and Mearscheimer (Morgenthau 1948; Waltz 1979; Mearsheimer 2001). Secondly, many institutionalists adopt a state-centered perspective in order to emphasise the role that institutions, path dependency and formal negotiation play in shaping domestic politics and, in turn, international relations. Skocpol, Krasner and Keohane have all repeatedly espoused such an approach from historical, sociological and liberal perspectives respectively (Krasner 1972; Skocpol 1979; Keohane 1989). Finally, a state-centric and institutionalist perspective on state governance claims that even those governance arrangements involving non-state actors are fundamentally set up and orchestrated in a hierarchical fashion by the state itself. This argument is made by Wallington, Lawrence and Loechel when they claim that there has been a tendency to mistake the state's

attempts to govern "better" through enhanced cooperation with societal actors with the state's abdication of its functions to these (Wallington, Lawrence and Loechel 2008). A point, this one, subsequently stressed also by Bell and Hindmoor: "our approach is state-centred because we argue that governments rely upon hierarchical authority to implement their policies and because, even when governments *choose* to govern in alternative ways, the state remains the pivotal player in establishing and operating governance partnerships and strategies" (Bell and Hindmoor 2009). Applied to a hypothesis that locates in the humanitarian mechanism and the administrative apparatus of the state the key forces driving the extent to which a national government should be prompted to provide humanitarian assistance, state-centered theory would expect a state to disburse humanitarian aid following dynamics internal to the donor state itself. State-centered theory would therefore expect that the extent to which a donor country's humanitarian mechanism has been exposed to international dynamics, the degree to which it is sheltered from undue political pressure, the financial means at its disposal and the its administrative capacity to all play a significant role in influencing the extent to which a donor country would be ready to disburse humanitarian assistance to countries stricken by a sudden natural disaster.

### 2.2. Investigated variables

This second part of the analytical framework and research methodology presents on the one hand the dependent variable and, on the other hand, the independent variables for each one of the three alternative explanations under consideration. Both the dependent variable and each independent variable are presented through a three-step approach. To begin with, the variable in question is introduced. Secondly, the selected variable is operationalized. Finally, the data sources for the investigated variable are given.

#### 2.2.1. Dependent variable

1. Presentation

This dissertation wishes to establish which factors are most likely to influence the provision of emergency humanitarian assistance on behalf of a donor country to a disaster-stricken country. With this objective in mind, the chosen dependent variable is the amount of emergency humanitarian assistance provided by a donor country to a disaster-stricken country following the onset of a natural disaster. This variable is selected for a number of reasons. To begin with, the disbursement (as opposed to the pledge to disburse) of emergency humanitarian assistance can be seen as an unequivocal signal of the willingness of a donor

country to truly assist countries that have been struck by a sudden natural disaster. Secondly, selecting humanitarian disbursements provided in response to a specific natural disaster (as opposed to disbursements placed in a permanent multilateral "stand-by" fund) allows evaluating which specific independent variables might affect the decision to disburse humanitarian assistance following a specific humanitarian catastrophe. Finally, the data available in terms of disbursements of humanitarian assistance on behalf of national governments is readily available and of a neutral and undisputable quality as it has been collected and standardised by the United Nation's Office for the Coordination of Humanitarian Affairs.

2. Operationalization

The dependent variable (DV) of this dissertation is the amount of emergency financial assistance provided by national governments following the onset of a sudden natural disaster. Through its Financial Tracking Service (FTS), the United Nation's Office for the Coordination of Humanitarian Affairs (UN OCHA) provides an extensive database that includes all the disbursements provided by the selected donor governments for the entire period of analysis, the name of the recipient country and the date when the actual disbursement took place. In order to operationalize the DV for each one of the ten natural disasters investigated in this dissertation, the exact amount of emergency financial assistance disbursed by each one of the seven donor countries under investigation is recorded for the twenty-one days following the onset of each natural disaster. The data is computed in US$: this is because two out of the seven countries under investigation are outside the Eurozone (the United kingdom and Denmark) and because the provision of emergency financial assistance provided through the United Nations Office for the Coordination of Humanitarian Assistance's Financial Tracking System (FTS) is recorded in US$.

3. Data sources

In order to investigate the dependent variable (i.e. the provision of humanitarian aid by national governments to disaster-stricken countries), comprehensive data is available through the Financial Tracking Service (FTS) of the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA). For the whole period of analysis, OCHA's FTS provides accurate data on the exact date and amount of all disbursements (as opposed to pledges) of emergency financial assistance on behalf of the selected seven donor governments to all

recipient countries under investigation. Data is provided in US$ and the specific natural disaster for which a disbursement was released is always made available.

### 2.2.2. Independent variables for the "domestic politics" explanation

As mentioned before, a first explanation for changes in the dependent variable concentrates on domestic politics as the key factor influencing the provision of emergency humanitarian assistance on behalf of a donor country. Within such an understanding, the underlying assumption is that, the more prominent and marked certain domestic factors are within a donor country, the more likely it is that the donor country in question will provide greater amounts of emergency humanitarian assistance to a country affected by a sudden natural disaster. In the following paragraphs, each independent variable selected for the "domestic politics" explanation is presented, operationalized and its sources are given.

#### 2.2.2.1. Gross Domestic Product (GDP)

1. Presentation

The size of a country's Gross Domestic Product (GDP) is likely to have an impact on the extent to which a donor government can provide emergency humanitarian assistance to disaster-stricken countries. From a political economy perspective, it is reasonable to expect that countries with a more substantial Gross Domestic Product (GDP) have the means to provide greater amounts of financial assistance to countries that have been struck by a sudden natural disaster. The underlying assumption for such a statement is that the provision of emergency humanitarian assistance is a policy that can more easily be implemented by those countries that can "afford being generous" thanks to both the availability of financial means as well as the existence of political capital accumulated by having already attended to their own citizens economic and social needs.

2. Operationalization

In order to quantify a donor country's Gross Domestic Product (GDP), the absolute GDP of a donor country at the time of its disbursement of emergency humanitarian assistance to a country struck by a natural disaster is recorded. Data is then converted in US$ at the average exchange rate for the period under investigation. The choice to use US$ is made for two fundamental reasons. Firstly, to use a "comparable third party currency" that is neither the Euro nor the currency of a non-Euro member state of the European Union. Secondly, data is

provided in US$ in order to keep using the "international reference currency" that is used by most organisations that operate within the international humanitarian system.

3. Data sources

Data for the Gross Domestic Product (GDP) of the donor countries under investigation at the time of each disbursement is provided by Eurostat: the Directorate-General of the European Commission in charge of providing standardised statistical information for the European Union and its member states.

**2.2.2.2. Government orientation**

1. Presentation

The presence in power of a centre-left or a centre-right government can be expected to influence the extent of humanitarian aid provided by a donor country. Indeed, because of the significant emphasis that European labour and social-democratic parties have traditionally placed on international cooperation and solidarity, it could be expected that the presence in government of a centre-left coalition could be more conducive to greater disbursements of humanitarian aid than a conservative one.

2. Operationalization

To operationalize this variable it is necessary to determine whether, at the moment of the disbursement of emergency financial assistance, a donor country is governed by a centre-left or a centre-right coalition. In order to establish the political orientation of the government in power at the time of disbursement, this dissertation explores whether a centre-left or a centre-right party commanded the relative majority of seats in the donor country's national parliament. Such a choice is made in light of the fact that, where coalition governments rather than one-party governments are in power, the party with the relative largest number of seats in the national parliament can be expected to play a predominant role in policy-making decisions.

3. Data sources

Data used in order to determine the political orientation of the ruling party in a donor country at the onset of each one of the ten natural disasters under investigation is collected through the database of the International Foundation for Electoral Systems (IFES).

#### 2.2.2.3. Electoral period

1. Presentation

Whether or not a donor country finds itself in a period that is soon to witness national elections can be expected to influence the extent to which the government in power is ready to disburse emergency humanitarian assistance. Indeed, such a hypothesis rests on the assumption that a ruling party will be eager to portray itself as "compassionate and morally adequate" in the eyes of the donor country's electorate.

2 Operationalization

In order to determine whether or not a donor country finds itself within an electoral period, this dissertation investigates whether or not the twenty-one days following the onset of any of the ten selected natural disasters fall within one hundred days of a scheduled national election. For this purpose, the electoral calendar for countrywide elections of each donor country within the whole period of analysis is investigated. Given that the length of the official pre-electoral campaign period for national elections varies from one donor country to another, an arbitrary period of one hundred days is selected as a common benchmark for all donor countries under investigation.

3. Data sources

Necessary data in order to determine whether a donor country finds itself within an electoral period is gathered through the database provided by the International Foundation for Electoral Systems (IFES).

#### 2.2.2.4. Media coverage

1. Presentation

The extent to which a natural disaster is reported in a donor country's media can be expected to influence the government's decision to disburse emergency aid. Increases in issue salience in the media should lead to greater aid disbursements due to a causal mechanism whereby media reporting can contribute to ensure that a natural disaster is placed on a donor country's political agenda. Once a natural disaster has been put at the top of the political agenda within the donor country's public sphere, societal meobilization demanding action on behalf of the national government is more likely to take place and to be effective. As result of this, governmental authorities will be put under pressure to take action by providing some form of

humanitarian assistance. Increases in disbursements of humanitarian assistance can therefore be expected.

2. Operationalization

A key centre-left and a key-centre right newspaper are chosen for each donor country. These are analysed for the twenty-one days following each natural disaster. The total number of articles reporting on each selected natural disaster is then recorded on a daily basis. Such an approach is chosen so as to take into account the broadest possible spectrum of political views held by the broadest possible spectrum of citizenry. Both more progressive and more conservative socio-political perspectives are therefore taken into consideration. The selected newspapers are the following. The Netherlands: Handelsblad / De Telegraaf. Denmark: Politiken / Jyllands-Posten. United Kingdom: The Guardian / The Times. France: Le Monde / Le Figaro. Germany: Frankfurter Rundschau / Die Welt. Spain: El Pais / El Mundo. Italy: La Repubblica / Il Corriere della Sera.

3. Data sources

In order to operationalize the independent variable on media coverage, data for all articles published on selected natural disasters throughout the period of analysis is obtained primarily through the internet-based LexisNexis database. When the required information is not available through the LexisNexis database, data is collected directly from the digital archives of the newspapers themselves.

### 2.2.3. Independent variables for the "disaster's magnitude" explanation

A second explanation accounting for variation in the dependent variable focuses on the magnitude of the natural disaster in question as a key determinant for a donor country's delivery of humanitarian aid. Within such an understanding, the underlying assumption is that, the greater the magnitude of a natural disaster under investigation, the greater the amount of emergency financial assistance that a donor country is ready to provide to the disaster-stricken country. In the following paragraphs, each independent variable selected for the "disaster's magnitude" explanation is presented, operationalized and its sources are given.

#### 2.2.3.1. Catastrophe day

1. Presentation

The number of days that have elapsed since the outbreak of a natural disaster can be expected to play a significant role in affecting a donor country's disbursement of humanitarian assistance. Indeed, due to the very nature of a humanitarian catastrophe, it is in the very first days following the onset of a natural disaster that the most acute phase of a humanitarian catastrophe can be recorded. It is therefore reasonable to expect that, the more limited the amount of time that has elapsed since the beginning of a humanitarian emergency, the greater the amount of humanitarian assistance that a donor country is likely to provide to the disaster-stricken country.

2. Operationalization

The first twenty-one days since the onset of each natural disaster are taken into consideration. A strong negative correlation is expected to take place whereby, as the number of days that have elapsed since the onset of a natural disaster increases, the amount of emergency humanitarian assistance provided decreases. This expectation rests on the assumption that, due to the very nature of humanitarian disasters, greater amounts of emergency financial assistance are necessitated throughout the days immediately following the onset of a natural disaster.

3. Data sources

The twenty-one days that have elapsed since the onset of a selected natural disaster are calculated from the first day of the disaster as recorded by the United Nations Office for the Coordination of Humanitarian Affairs' Financial Tracking Service (UN OCHA FTS).

#### 2.2.3.2. Fatalities recorded

1. Presentation

The total number of fatalities recorded as result of a natural disaster can reasonably be seen as an indicator of the magnitude of the humanitarian catastrophe itself. As such, the number of fatalities recorded can spur the humanitarian department of a donor country to step up its efforts to provide emergency humanitarian assistance to the affected population.

2. Operationalization

In order to determine the number of fatalities that have been recorded following each natural disaster under investigation, the daily number of recorded fatalities is annotated for each one of the twenty-one days following the onset of a natural disaster. For this purpose, data is obtained from the International Disaster Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) of the Catholic University of Louvain: a comprehensive and reliable source with data on all recorded natural disasters worldwide.

3. Data sources

Data for the total number of fatalities recorded for each one of the ten natural disasters under investigation is always collected through the International Disaster Database (EM-DAT) of the Centre for the Epidemiology of Disasters (CRED) of the Catholic University of Louvain (UCL).

**2.2.3.3. People affected**

1. Presentation

Together with the total number of fatalities recorded, the total number of people that have been affected by a natural disaster is another indicator of the "human toll" that a natural disaster as taken on the affected population. In humanitarian studies, the concept of "people affected" refers to all those individuals that, although having survived the natural disaster, have been displaced, have lost their livelihoods, have been injured or have lost their homes as result of the humanitarian catastrophe.

2. Operationalization

In order to determine the number of people that have been affected by a humanitarian catastrophe, the dissertation records the number of individuals that have lost their livelihood or their home, that have been injured or that have been displaced by the natural disaster in question. Again, for this purpose, data is obtained from the International Disaster Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) of the Catholic University of Louvain.

3. Data sources

Data for the total number of people affected for the ten humanitarian catastrophes under investigation is collected through the International Disaster Database (EM-DAT) of the Centre for the Epidemiology of Disasters (CRED) of the Catholic University of Louvain (UCL).

**2.2.3.4. Estimated damages**

1. Presentation

Last but certainly not least, the total amount of estimated damages that have occurred as the result of a natural disaster contributes to provide a picture of the magnitude of a natural disaster. While closely related to the two previous variables, this indicator focuses more on the material losses sustained by a population rather than on the "human cost" that has been paid as result of a natural disaster.

2. Operationalization

In order to determine the estimated damages caused by a natural disaster under investigation, the dissertation notes the amount of financial damage recorded on each one of the first twenty-one days following the onset of a selected catastrophe. Once more, for this purpose, data is obtained from the International Disaster Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) of the Catholic University of Louvain.

3. Data sources

Data concerning the estimated damages caused by each one of the ten natural disasters under investigation is collected through the International Disaster Database (EM-DAT) of the Centre for the Epidemiology of Disasters (CRED) of the Catholic University of Louvain (UCL).

**2.2.4. Independent variables for the "humanitarian mechanism" explanation**

Finally, a third explanation for variation in the dependent variable highlights the characteristics of a donor country's humanitarian mechanism as the fundamental force determining the extent to which humanitarian assistance is provided. Within such an understanding, the underlying assumption is that, the more sophisticated and efficient the humanitarian mechanism of a donor country is, the greater the likelihood is that the donor country in question will release emergency humanitarian assistance to a recipient country

following the onset of a humanitarian disaster. In the following paragraphs, each independent variable selected for the "humanitarian mechanism" explanation is presented, operationalized and its sources are given.

#### 2.2.4.1. Internationalisation

1. Presentation

The extent to which the humanitarian department of a donor country has committed itself to work together with international stakeholders can act as a powerful "pressure mechanism" whereby the donor country under investigation feels obliged to live up to the expectations that it has raised within the humanitarian community. Indeed, a country that has been significantly involved with its international partners might perceive that a "logic of appropriateness" compels it to disburse humanitarian assistance to disaster-stricken countries so as to match its political engagement with an adequate financial commitment.

2. Operationalization

In order to gain an understanding of the extent to which a donor country is embedded within the international humanitarian community, this dissertation engages in an exploration of the initiatives taken by the donor country in question to contribute to multilateral initiatives in the field of the provision of both humanitarian and development assistance. A brief analysis of the initiatives taken over the years by each donor country's humanitarian departments is therefore carried out for each one of the seven case studies under investigation.

3. Data sources

In order to operationalize the independent variable on the degree of "internationalization" of a donor's humanitarian department, data on a country's participation in international initiatives and institutionalised agreements is collected from the comparative country reports prepared by Development Initiatives' Global Humanitarian Assistance (GHA) programme: one of the most comprehensive comparative surveys available in the field of international humanitarian assistance.

#### 2.2.4.2. Financial commitment

1. Presentation

The extent to which a donor country is committed to the broad socio-economic advancement of economically least developed countries is likely to affect the extent to which it might also be ready to provide them assistance in case of a sudden natural disaster. Indeed, humanitarian aid is only one component of the Overseas Development Assistance (ODA) that economically advanced countries can provide to economically less developed ones. It can therefore be assumed that countries that perform particularly well in terms of financial resources dedicated to the provision of long-term development aid also perform particularly well when it comes to the provision of emergency humanitarian assistance.

2. Operationalization

In order to estimate the extent to which a country is ready to commit resources to the provision of development assistance, the yearly percentage of Gross National Income (GNI) that a donor country devotes to Overseas Development Assistance (ODA) is calculated for the whole period of analysis. Once that has been done, the percentages for each year of analysis are converted into an average for the whole period of analysis.

3. Data sources

Data for the amount of Gross National income (GNI) that each donor country under investigation dedicates to the provision of Overseas Development Assistance (ODA) has been obtained from the United Nations Statistics Division (UNSD) of the United Nations' Department of Economic and Social Affairs (DESA): an authoritative source for the collection and dissemination of standardised and comparable data from, among others, those countries that belong to the Development Assistance Committee (DAC) of the Organisation for Economic Cooperation and Development (OECD).

#### 2.2.4.3. Operational independence

1. Presentation

The humanitarian departments of different donor countries are more or less likely to be operationally free of undue political interference. On the one hand, it is reasonable to assume that those humanitarian departments that can count only on limited operational independence are more likely to have to bow to political pressure and to align their policy decision with

their government's strategic and geopolitical considerations. On the other hand, it can be expected that the humanitarian departments of those countries that enjoy a significant degree of operational independence from political pressure are more likely to feel free to provide emergency humanitarian assistance to the survivors of a disaster-stricken country in line with exclusively humanitarian considerations. The degree of operational independence enjoyed by a country's humanitarian department can therefore directly affect the amount of humanitarian assistance that this is able to provide.

2. Operationalization

In order to assess the extent to which the humanitarian department of a national government is in a position to base its policy-decisions on strictly humanitarian criteria as opposed to strategic or geopolitical considerations, this dissertation investigates those indicators that might suggest a more or less prominent degree of operational independence from undue political interference. Such indicators might include the delegation or not of operational control of a humanitarian agency to non-politically appointed civil servants; the presence or not of specific legislative acts aimed at ensuring a humanitarian agency's operational independence; the fact that humanitarian flows might or might not follow a donor country's geostrategic interests and, finally, the type of funding channels (bilateral or multilateral) most frequently chosen by a country's humanitarian agency in order to provide humanitarian assistance.

3. Data sources

Evidence to evaluate the degree of a humanitarian agency's operational independence is obtained from both primary and secondary sources. These include the donor countries humanitarian agencies' websites, country-specific evaluations carried out by the Organisation for Economic Cooperation and Development's Development Assistance Committee (DAC), research conducted within the framework of Development Initiatives' Global Humanitarian Assistance (GHA) programme and evidence collected in the Development Assistance Research Associates' (DARA) Humanitarian Response Index.

#### 2.2.4.4. Administrative capacity

1. Presentation

A national government might be more than willing to provide significant financial assistance to the victims of a natural disaster but might be unable to release it efficiently and in a timely

fashion. The administrative capacity of a donor country is therefore bound to impact upon the quantity and the speed at which emergency financial assistance is provided to disaster-stricken countries following the sudden onset of a humanitarian catastrophe. The administrative capacity of a donor country is in this context understood as the extent to which the institutional set up of a donor country's humanitarian mechanism is conducive to the timely and efficient coordination of emergency financial assistance.

2. Operationalization

In order to assess the administrative capacity of the humanitarian mechanism of each donor country under investigation, four indicators are taken into considerations. To begin with, the presence or not of a specific unit dedicated to the provision of humanitarian assistance within the donor country's agency tasked with the provision of development assistance to less economically developed countries is accounted for. Secondly, this section explores whether the humanitarian mechanism of the donor country in question is characterised by the fragmentation of humanitarian activities among different agencies or if all of these are centralised within a single institution. Thirdly, this dissertation investigates whether or not a donor country's humanitarian agency has set up a specific forum to coordinate its action with the other humanitarian stakeholders operating within the donor country itself (NGOs, international organisations etc.). Finally, the size of the financial endowment on which a humanitarian agency can count upon on a yearly basis is identified.

3. Data sources

Data to assess the administrative capacity of each donor country is collected through a variety of literature. This includes country-specific studies carried out by the Organisation for Economic Cooperation and Development's Development Assistance Committee (DAC), country assessments made within the context of Development Initiatives' Global Humanitarian Assistance (GHA) programme, evidence from the Development Assistance Research Associates' (DARA) Humanitarian Response Index and the websites of individual national humanitarian agencies.

### 2.3. Period of analysis and selection of the case studies

This third part of the chapter dedicated to the analytical framework and the research methodology presents the investigated period of analysis and the selected case studies. The first brief section of this part of the chapter limits itself to explain why a specific period of

analysis has been taken into consideration. The second section of this third part of the chapter presents the selected case studies by focussing on the dependent variable upon which they have been selected.

### 2.3.1. Period of analysis

The period of analysis of this dissertation runs from the 1st of January 2000 to the 31st of December 2008. The focus of the dissertation is therefore on developments that have taken place since the year 2000 when the United Nations' Inter-Agency Standing Committee (IASC) called for an overhaul of existing international humanitarian aid practices worldwide (Development Initiatives 2000). Within such a period of analysis, this dissertation explores the performance displayed by national governments in terms of the provision of humanitarian aid to disaster-stricken countries over the eight years following the Inter-Agency Standing Committee's call for action. The selected period of analysis is therefore chosen so as to investigate a number of years when the international community called upon key European donor countries to renew their efforts to enhance their provision of humanitarian assistance worldwide.

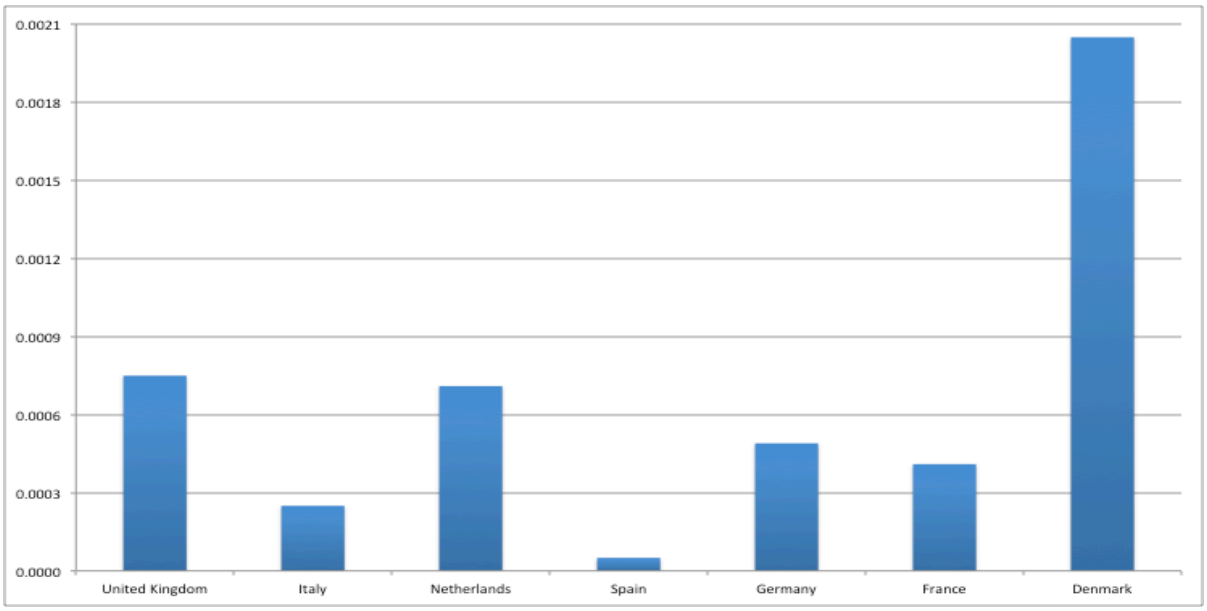
### 2.3.2. Selection of the case studies

Seven EU member states are selected as case studies: Denmark, the Netherlands, the United Kingdom, Germany, France, Italy and Spain. The choice to focus on European Union member states as opposed to donors from other regions of the world stems from the fact that, collectively, Europeans are by far the largest providers of humanitarian aid worldwide. A fact readily acknowledged both by European institutions themselves and by non-governmental actors alike (ECHO 2009; GHA 2009). The prominence of the role played European countries within the United Nations' Inter-Agency Standing Committee (IASC) is therefore what makes them a particularly interesting subject of analysis. Aside from this reason, these seven countries have also been chosen because, while it is fundamental to choose case studies that display a significant degree of variation on the dependent variable, it is equally important to select a group of countries that can be meaningfully compared. Indeed, the selected countries are comparable in that they share a number of fundamental characteristics. To begin with, they are all member states of the European Union. They have therefore undergone a significant degree of harmonisation of their economic, legislative and legal systems through, among other things, implementation of the European Union's *acquis communautaire.* Secondly, all countries under investigation are member of the North Atlantic Treaty

Organisation (NATO). They have therefore been for a long time embedded within a common political and diplomatic framework for what concerns their security and foreign policies. Finally, the selected countries are all socio-economically advanced west European democracies. They share therefore many common traits in terms of societal dynamics, policy challenges and welfare structures. The seven case studies that have been selected are therefore similar enough so as to provide comparable units of analysis and yet different enough to provide for variation in the dependent variable.

The selection of the seven case studies mentioned above has been made on the dependent variable: the average percentage of Gross National Income (GNI) that each donor country dedicates to the provision of humanitarian assistance for the selected natural disasters under investigation. As it is fundamental in terms of research design, the selected case studies display a significant degree of variation for their dependent variables. The following two graphs aim to further explore the dependent variable upon which the case studies have been selected by providing a comparative picture of the recorded disbursements of humanitarian. With this aim in mind, the first graph illustrates the total amount of humanitarian assistance provided by each donor country for all the natural disasters combined as a percentage of Gross National Income (GNI) while the second graph presents such disbursements in absolute terms.

Figure 2.3.2.1. Total disbursement for all emergencies as % of GNI per donor country



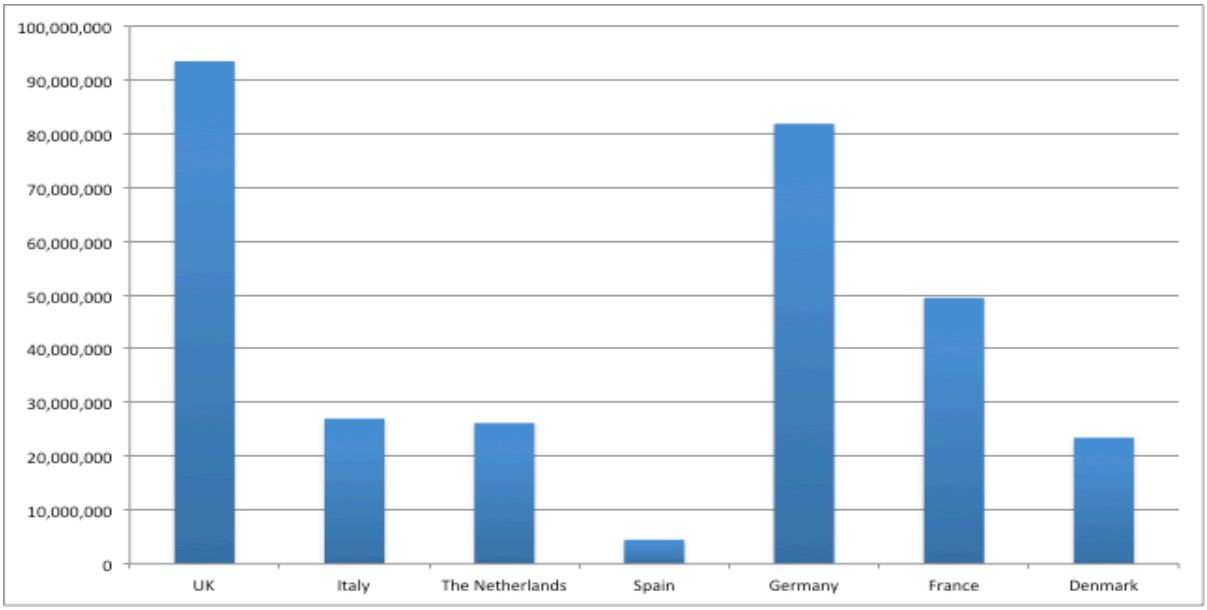

*Source: the author on elaborations from the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA) and Eurostat 2010.*

Figure 2.3.2.1 illustrates the total amount of disbursements of emergency financial assistance provided by each donor country for the ten largest humanitarian disasters that took place within the January 1st 2000 to December 31st 2008 period of analysis adjusted as a percentage of Gross National income (GNI).

The percentage of Gross National Income (GNI) disbursed for the provision of emergency financial assistance for the ten natural disasters under investigation makes up the dependent variable upon which the case studies have been selected. The results are stunning: dedicating over 0.0020% of its GNI to emergency humanitarian assistance, Denmark outperforms by far all other EU member states under investigation. Providing more than two and a half times emergency financial assistance as a percentage of GNI than the second-best performing donor under investigation, Denmark is the undisputed "winner" in terms of generosity towards disaster-affected countries. In distant second and third positions respectively, the United Kingdom and the Netherlands manage both to provide just above 0.0007% of their GNIs in emergency financial assistance. The performance of Germany and France is relatively similar and in both cases rather mediocre: the two countries providing approximately 0.0005% and 0.0004% of their GNI in emergency financial assistance. Italy scores particularly poorly by providing only just above 0.0002% of its GNI in emergency financial assistance to disaster-

affected countries. Finally, Spain scores bottom of the league with significantly less than 0.0001% of its GNI dedicated to the provision of emergency humanitarian assistance to the countries affected by the humanitarian crises under investigation. To sum up, the analysis of all disbursements as a percentage of GNI portrays a picture where four main groups of countries can be identified. First of all and with a stellar performance, Denmark is in a category of its own. Far from Denmark but with still more than acceptable performances, the United Kingdom and the Netherlands constitute a second group of countries in terms of the percentage of GNI dedicated to the provision of humanitarian assistance. Beyond this second group and with a rather mediocre percentage of their GNI expended on humanitarian aid, Germany and France make up a third group of countries. Finally and with very poor performances indeed, Italy and Spain make up a last group of countries.

Figure 2.3.2.2. Disbursement for all investigated catastrophes per donor country (US$)




*Source: the author on elaborations from the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA).*

Figure 2.3.2.2 illustrates the total amount of disbursements of emergency financial assistance provided by each donor country for the ten largest humanitarian disasters that took place within the January 1st 2000 to December 31st 2008 period of analysis in absolute terms (as opposed to as a percentage of GNI).

By looking at the graph, the remarkable performance of the United Kingdom becomes immediately apparent: despite an economy significantly smaller that that of Germany and comparable to that of France in terms of absolute GDP, the United Kingdom outperforms both

of its continental partners with an expenditure of over US$ 90,000,000. On the other hand, with an economy significantly larger than that of the United Kingdom, Germany only manages to provide just above US$ 80,000,000 in emergency financial assistance. France, with an economy of comparable size to that of the United Kingdom but an expenditure of just below US$ 50,000,000, only musters barely more than half of the contribution provided by the United Kingdom. Given the fact that its economy is of a comparable size to those of both the United Kingdom and France, Italy performs particularly poorly with an expenditure of approximately US$ 28,000,000: that is equivalent to roughly half the expenditure of France and to one third of the expenditure of the United Kingdom. With an expenditure hovering around US$ 25,000,000, both The Netherlands and Denmark post an impressive performance when compared to their peers. While their economies are puny in comparison to those of France and Italy, both The Netherlands and Denmark contribute half of the expenditure of France and even match the expenditure of Italy. Finally, Spain performs particularly poorly in terms of the provision of humanitarian aid for the ten humanitarian crises under investigation: with an economic size in between Italy and The Netherlands, Spain only manages to provide a tiny fraction of the emergency financial assistance provided by its fellow European Union's member states (US$ 5,000,000).

Moving beyond a narrow analysis of the dependent variable upon which the case studies have been selected, three major groups of countries can be identified. A first group (made up only by Denmark) displays an exceptionally high percentage of GNI dedicated to humanitarian assistance, a very high Gross Domestic Product (GDP) per capita, a very high degree of development measured in terms of Human Development Index (HDI) and the smallest population of the seven donor countries under investigation. A second group of countries (the Netherlands and the United Kingdom, Germany and France) records significantly different percentages of GNI dedicated to the provision of humanitarian assistance: the Netherlands and the United Kingdom both dedicating approximately 0.0007% of GNI to the provision of humanitarian assistance to the victims of the ten natural disasters under investigation while Germany and France dedicating only 0.0005% and 0.0004% respectively. These donor countries, however, display remarkably similar data for what concerns their GDP per capita, their HDI and their total populations. Indeed, all these four countries can count on a significantly high GDP per capita (ranging between US$ 52,843,000 for the Netherlands to US$ 44,181,000 for Germany), on relatively good performances in terms of HDI (ranging from 0.958 for the Netherlands to 0.940 for Germany) and on relatively large populations (ranging from 82,541,000 people in the case of Germany to 16,305,000 people in the case of

the Netherlands). Finally, Italy and Spain make up a third own category. Indeed, both Italy and Spain display a significantly below average percentage of GNI dedicated to humanitarian aid (just above 0.0002% and just below 0.0001% respectively), a relatively low GDP per capita (US$ 38,532,000 and US$ 35,829,000 respectively), an average degree of human development (0.945 and 0.949 respectively) and relatively large total populations (58,671,000 and 43,395,000 inhabitants respectively). Figure 2.3.2.3 summarises the data for the selected case studies by complementing the dependent variable upon which they have been chosen (humanitarian aid as a percentage of GNI) with data about the countries' GDP per capita, Human Development Index and total population.

Figure 2.3.2.3. Summary table for the selected donor countries (2008 data)

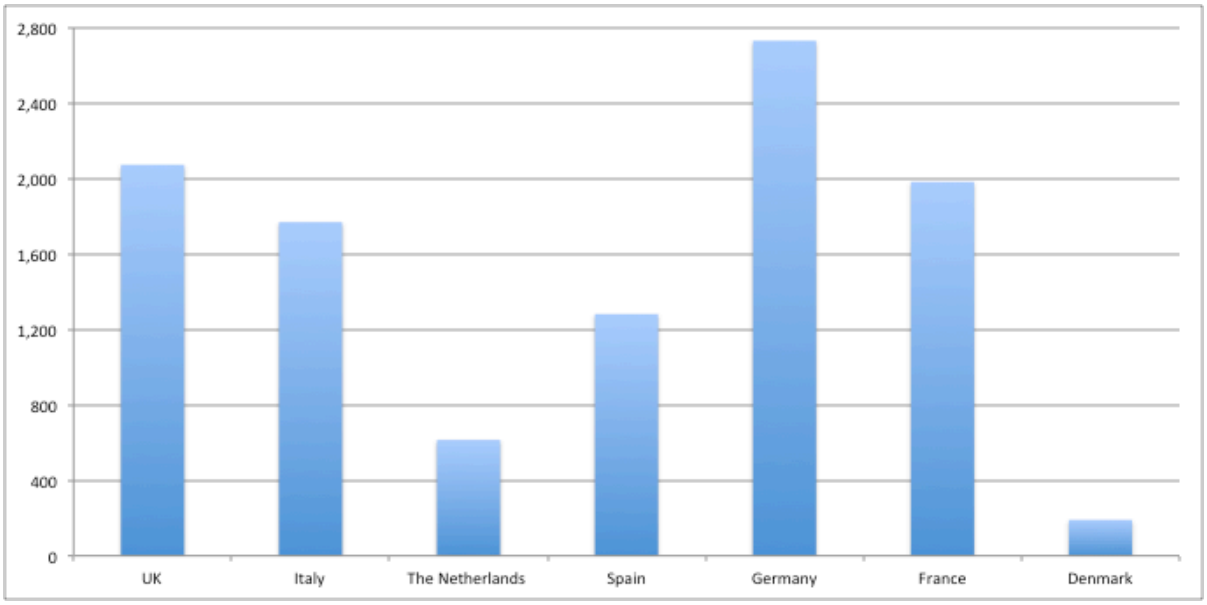
| Case study | Aid (% of GNI) | GDP per capita (US$) | HDI | Total population |
|---|---|---|---|---|
| Denmark | 0.0020 | 62,438,000 | 0.952 | 5,419,000 |
| The Netherlands | 0.0007 | 52,843,000 | 0.958 | 16,305,000 |
| United Kingdom | 0.0007 | 43,401,000 | 0.942 | 60,203,000 |
| Germany | 0.0005 | 44,181,000 | 0.940 | 82,541,000 |
| France | 0.0004 | 44,639,000 | 0.955 | 60,997,000 |
| Italy | 0.0002 | 38,532,000 | 0.945 | 58,671,000 |
| Spain | 0.0001 | 35,829,000 | 0.949 | 43,395,000 |

*Sources: the author; UNData 2011c; UNDP 2008; UNData 2011b.*

Last but not least and having presented the dependent variable upon which the case studies have been selected, figure 2.3.2.4 wishes to provide a more general idea of the size of the economies of the seven EU member states under investigation. Such an understanding is important in order to observe the contribution that each analysed country could potentially provide in terms of emergency humanitarian assistance. Indeed, the GDP of each one of the

countries under investigation constitutes one of the independent variables that are later on tested against the dependent variable. With this aim in mind, figure 2.3.2.4 comparatively illustrates the absolute average GDP for each donor country at Purchasing Power Standards (PPS) for those years when one of the ten natural disasters under investigation took place. This graph is therefore important because it highlights which donor countries are theoretically able to provide the greatest amounts of emergency humanitarian assistance both in absolute and relative terms.

Figure 2.3.2.4. Average GDP per donor country at PPS. Selected years (US$ billions).




*Source: the author on elaborations from Eurostat 2010.*

Figure 2.3.2.4 illustrates the average GDP per capita for each one of the investigated donor countries for the years 2001, 2004, 2005, 2006, 2007 and 2008 combined. These are the years when the ten humanitarian catastrophes under investigations took place.

With an average GDP of almost US$ 2,750 billion, Germany is by far the largest national economy under investigation and could theoretically provide the largest amounts of emergency financial assistance to disaster-stricken countries. With an average GDP of just above and just below US$ 2,000 billion respectively, the United Kingdom and France follow Germany in second and third place as the countries with the largest economies among those under investigation. Indeed, the two countries can virtually be seen as equal in terms of economic weight in that the recorded size of their economies changes almost on a yearly basis according to fluctuations in the value of the British Pound and the Euro. With an average GDP of just above US$ 1,750 billion for the selected years of analysis, Italy is a distant fourth

in terms of absolute economic size while, with an average GDP for the selected years in the range of US$ 1,250 billion and less than half of the size of Germany's, Spain is the fifth largest economy among the countries under investigation. Finally, The Netherlands and Denmark come a distant sixth and seventh respectively in terms of absolute size of their economies within the sample of countries under analysis: their economies averaging US$ 600 billion and US$ 200 billion at Purchasing power Standards (PPS) respectively in the years under investigation. If the seven EU member states under investigation were to provide humanitarian aid in line with the sizes of their economies, Germany would have to provide the lion's share of assistance. The United Kingdom and France would come next and Italy and Spain would be the fourth and fifth largest providers of humanitarian aid. Finally, The Netherlands and Denmark would be required to contribute the smallest amounts of humanitarian assistance.

### 2.4. Research methodology

This part of the chapter dedicated to the analytical framework and the research methodology aims to present the actual practical steps that have been taken to elaborate the data available for the dissertation. Because the previous parts of this chapter have already dealt with a variety of questions relating to the analytical framework, the theoretical background and the selection of the case studies, the final part of this chapter limits itself to describe the specific procedure employed to elaborate the data presented in chapter four. In order to do so, this last part of the chapter is divided into four sections. The first section describes the steps taken to obtain the empirical results for the dependent variable. The second section outlines the procedure through which results have been obtained for all countries combined. The third section illustrates the methodology that was employed to obtain the quantitative results for each individual donor country. Finally, the last section presents the steps taken in order to obtain the qualitative results for the individual donor countries under investigation.

#### 2.4.1. Analysis of the dependent variable

A number of specific steps are taken in order to obtain the relevant data for the amount of emergency financial assistance provided by each donor country to the victims of the ten natural disasters under investigation. To begin with, data on the actual disbursements (as opposed to pledges) of emergency humanitarian assistance is obtained from the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA). Secondly, a dataset is compiled for every donor country. In this data set,

the exact amount of emergency humanitarian assistance disbursed by a donor country over the twenty-one days following the onset of each one of the ten natural disasters under investigation is recorded. Thirdly, the disbursement value is substituted by a logarithmic value so as to obtain a linear correlation that can be determined by linear regression. This is done because the disbursement values span several orders of magnitude while the other variables remain within very similar orders of magnitude, thus suggesting that the eventual correlation between the dependent variable and the independent variables is exponential rather than linear. Finally, the data collected for the dependent variable is normalised so as to more easily determine the degree of influence of the coefficients.

### 2.4.2. Analysis of all countries combined

The first part of chapter four therefore presents the data collected for all donor countries combined through a multivariate analysis. In order to do so, data collected to operationalize the independent variables identified for the "domestic politics" and the "disaster's magnitude" hypotheses is normalised so as to be able to better analyse the coefficients of the independent variables themselves when running a multiple regression analysis. When running the multiple regression analysis, Generalized Least Squares (GLS) are employed instead of Ordinary Least Squares (OLS). That is the case because GLS estimates the unknown parameters in a linear regression model and can therefore address issues pertaining to autocorrelation and heteroskedasticity.

In a situation whereby longitudinal data (days) are nested within time periods within countries, autocorrelation is likely to take place. Autocorrelation is the correlation of residual error terms from observations of the same variable at different points in time. Autocorrelation violates the Ordinary Least Squares (OLS) assumption that residual error terms are not correlated: standard errors tend to be underestimated and t-values overestimated and, because of that, GLS are used. Also within this context, the concept of heteroskedasticity refers to the presence of unequal variances between observations (i.e. the situation when one or more sub-populations have variabilities different from the others). Heteroskedasticity does not bias the coefficients but can bias standard errors thus weakening possible inferences. This is a problem because significance tests with Ordinary Least Squares (OLS) are based on the assumption that error terms have constant variance. OLS therefore works with homoskedastic errors but not heteroskedastic ones. On the other hand, Generalised Least Squares (GLS) is used because it relaxes the homoskedastic assumption by using information available to obtain unbiased estimates of the variance.

Generalised least squares, however, do not solve eventual multicollinearity problems. Multicollinearity is the highly linear correlation between two or more predictors. In such a situation, coefficients might change significantly with minor changes in the model. However, while the model might still be reliable, the values of the individual predictors might not be so. Fortunately, one can be alerted to the presence of multicollinearity by the fact that the standard errors of the coefficients tend to be large. If that is the case, the Variance Inflation Factor (VIF) can be used to check for the presence of multicollinearity. In order to do so, the variance inflation factor regresses one explanatory factor on all others. When no VIF is recorded above 20 and no 1/VIF is recorded below .05, no multicollinearity is detected. Within the context of this study, the variance inflation factor was checked for all multiple regression analyses and muticollinearity was not recorded in any of the regressions.

Having said so, in the specific multiple regression analysis comprising all donor countries combined, six dummy variables (one less than the total number of selected case studies) are inserted for statistical purposes. Dummy variables are qualitative variables that take values of 0 and 1 (binary) to indicate the absence or the presence of potentially significant factors. With a 0 value, the coefficient disappears. With a 1 value, the coefficient functions as an additional predictor. Dummy variables are included in a multiple regression analysis so as to indicate residual differences between donor governments (i.e. unit effects) when regressing all donor countries together. The coefficient of a dummy variable, therefore, indicates the average difference between the group coded with 1 and the base group coded with 0 (i.e. the category which is not explicitly represented by a dummy variable) once having controlled for all other predictors. Within this context, it is fundamental to avoid the dummy variable trap: a situation of perfect collinearity between variables. In order to avoid it, the multiple regression analysis carried out for all donor countries combined made sure to contain only n-1 dummy variables (whereby n was the number of case studies under investigation).

Following up on what mentioned above it shall be noted that, in a regression, the coefficient is the size of the effect that the independent variable has on the dependent variable. More specifically, in a multiple regression analysis, the coefficient is the extent to which the dependent variable is expected to increase when the independent variable increases by one while keeping all other independent variables constant. Indeed, the size of the coefficient gives the grade of influence of the independent variable but only if data has been normalized (i.e. only if all values have been divided by the maximum value). Whether or not a coefficient has a large or only a moderate effect is a relative concept depending on the relative strength of

the predictors. In order to compare the relative strength of the predictors, one has therefore to obtain the standardized regression of the coefficients (i.e. the coefficients that are measured in standard deviations instead of the units of the independent variables). Within this study, the coefficients were standardized for all variables before running the multiple regression analysis so as to be able to compare the size of the effect of the explanatory variables.

Last but not least and concerning the specification of the explanatory model, it shall be pointed out that different alternatives (adding the predictors one by one) were tested and the results were consistent in terms of direction and magnitude with the final, fully specified, model displayed in chapter four. Within the context mentioned above, time lags were included in the multiple regression analysis because media coverage (i.e. the articles referring to a natural disaster under investigation published in the national media) would not be found in the donor country's national media on the day of the natural disaster itself. Therefore, the multiple regression analysis looked for a correlation between the dependent variable and the selected independent variable on the same day of the onset of the natural disaster, on the day before and so forth. Furthermore, it shall be noted that the values of the disbursements spanned several orders of magnitude. Therefore, the eventual relationship that was expected to take place between the dependent variable and the independent variables would have been exponential and not linear. Because of that, the disbursement value was replaced by its logarithmic value. By doing so, the relation become linear and could be determined by the linear regression.

After the multiple regression analysis for all donor countries combined, a series of five graphs is presented. More specifically, a first graph highlights the total disbursement for all investigated catastrophes for each donor country, a second graph investigates the total disbursements for all donor countries combined for the whole period of analysis and a third graph provides an insight into the disbursements for the whole period of analysis per donor country. These first three graphs are therefore presented in order to provide a better insight into the dynamics pertaining to the dependent variable under investigation. Having done that, a fourth graph illustrates the total number of fatalities recorded for each natural disaster under investigation throughout the whole period of analysis while a fourth and final bivariate graph investigates the correlation between fatalities and disbursements.

### 2.4.3. Individual countries: quantitative analysis

In terms of the quantitative analysis carried out individually for each one of the seven donor countries combined, the following steps are taken. First of all, a multiple regression analysis is run for all the independent variables vis-à-vis the dependent variable constituted by the disbursements of humanitarian assistance released by the donor country under investigation. In order to do so and to begin with, a multiple regression analysis tests the normalised values of the eight independent variables selected for the "domestic politics" and for the "disaster's magnitude" hypotheses against the dependent variable made up by the disbursements of humanitarian assistance. As previously done for all donor countries combined in order to deal with eventual issues of heteroskedasticity and multicollinearity, generalised least squares are used as opposed to ordinary least squares. Secondly and again as it has been done for all donor countries combined, the variance inflation factor of the multiple regression analysis is observed in order to detect eventual multicollinearity issues. Finally, a graph provides a comparison of the observed and the predicted values of the disbursements. This is done in order to visually present the results obtained by the mathematical model for the logarithm of the disbursement value against its estimated values over the twenty-one days following the onset of each natural disasters under investigation. Having done that, two graphs are introduced to better highlight the relationship between selected variables. More specifically, a first graph presents the recorded disbursements of humanitarian assistance released by the donor country under investigation while a second graph explores the number of recorded fatalities against the recorded disbursements of humanitarian assistance.

### 2.4.4. Individual countries: qualitative analysis

In order to carry out a qualitative analysis of the donor countries under investigation for the "humanitarian mechanism" hypothesis, four independent variables are identified. Each one of the four independent variables is tackled through a three-step approach. To begin with, the selected independent variable is presented: particular care is taken in this respect to highlight why such a variable is selected and how this might contribute to investigate the "humanitarian mechanism" hypothesis. As a second step, the selected variable is operationalized: a detailed explanation of how the variable is assessed is therefore given. Finally, the sources from which data for the investigated variable has been collected are given.

## 3. Analysis of the humanitarian catastrophes under investigation

This research project investigates the reaction of seven EU member states' governments in terms of their provision of emergency humanitarian assistance to the victims of natural disasters that have taken place worldwide between the 1st of January 2000 and the 31st of December 2008. Indeed, it is important to highlight that this dissertation focuses only on natural disasters (as opposed to complex emergencies and man-made disasters). The choice to limit this investigation to natural disasters is made in order to exclude all those humanitarian emergencies that, in light of their "man-made component", would involve an analysis of additional intervening variables that would go way beyond the scope of this dissertation. Furthermore, in order to be included in the research sample, a natural disaster must have recorded at least 1,000 fatalities, it must have affected at least an estimated 1,000,000 people and it must have caused estimated damages worth at least US$ 1,000,000,000 as reported through the International Disaster Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) of the Catholic University of Louvain (UCL). While the decision to apply such arbitrary parameters might lead to claims that data will be skewed because of a selection bias, such a choice is nevertheless appropriate. This is the case because it was necessary for the dissertation to ensure that all natural disasters were of a magnitude strong enough to be "recorded" (i.e. noted and acknowledged as significant) by the humanitarian agencies of all donor countries under investigation. Applying the three parameters mentioned above, ten natural disasters have been identified for the 1st of January 2000 to the 31st of December 2008 period. The sections below provide a brief introduction to the nature and the magnitude of the ten natural disasters that have been selected.

### 3.1. India earthquake 26/01/2001

At 08.46 local time on Friday the 26th of January 2001 (India's 51st Republic Day), an earthquake of magnitude 7.6 on the Richter scale at a depth of 16 km and with epicentre Chobari village struck the Indian region of Gujarat with shock waves reverberating for over 700 km from its epicentre. The exact coordinates of the earthquake were latitude 23.442 (ISC), longitude 70.310 E (ISC) and depth 16 km (ISC)) in Bhachau Taluka, Kutch District, Gujarat (USGS 2001). A peculiarity of this earthquake is that its epicentre was located far away from any fault lines between tectonic plates and that, therefore, the local population and infrastructure were in no way prepared to withstand the seismic event that took place. The most severely affected villages were the ones of Kutch, Bhuj, Bhachau and Anjar. Ahmedabad, Gujarat's capital and a sprawling city of nearly 5 million inhabitants, was also

badly affected by the collapse of dozens of multi-stories buildings and the reported deaths of hundreds of people while casualties were reported as far as into South-Eastern Pakistan (ASC 2001, Malik 2001). 20,023 people were killed, 7,236,304 people were affected and immediate damages amounted to an estimated US$ 2,623,500,000.

Figure 3.1.1. June 26th, 2001 India (Gujarat) earthquake quick reference table

| Date | Location | Event | Fatalities | Affected | Damage (US$) |
|---|---|---|---|---|---|
| 26/01/01 | India | Earthquake | 20,023 | 7,236,304 | 2,623,500,000 |

*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

### 3.2. India and Bangladesh floods 20/06/2004

On the 20th of June 2004, North-Eastern India and Bangladesh (and to a much minor extent Nepal) were struck by flash floods that killed 1,677 people, affected an estimated 69,808,532 individuals and caused an estimated damage worth US$ 5,073,700,000. While flesh floods struck Bangladesh already in June 2004, monsoon-related rains persisted up to October of the same year. According to the International Federation of the Red Cross (IFRC) over 40% of the country was inundated and over 1 million hectares of crops were destroyed, thus leading to steep increases in food prices that might have indirectly cost the lives of thousand of people over the months following the flash floods themselves (IFRC 2005). To top it all, the most devastating floods ever recorded since those that took place following the overflowing of the river Brahmaputra in 1998 had also predictably contributed to an explosion in the number of water-born diseases (AFP 2004 and DFO 2004). Finally, the fact that approximately half of the capital Dacca was flooded further hampered the coordination of humanitarian relief operations. By the time the emergency was over in October 2004, a staggering 35,000 Square Kilometres of the country and 50% of its population had somehow been affected by the floods (DER 2004).

Figure 3.2.1. June 20th, 2004 India and Bangladesh floods quick reference table

| Date | Location | Event | Fatalities | Affected | Damage (US$) |
|---|---|---|---|---|---|
| 20/06/04 | India/Bangladesh | Floods | 1,677 | 69,808,532 | 5,073,700,000 |

*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

### 3.3. South-East Asia tsunami 26/12/2004

On Sunday December 26th, 2004 (Boxing Day) at 00:58:53 Coordinated Universal Time (CUT), Southeast Asia was struck by what would become known within the scientific community as the Sumatra-Andaman earthquake. With an epicentre 160 km off the western coast of Sumatra, Indonesia, and just north of the island of Simeulue and a depth of 30 km below sea level, a 1,300 km rupture of the northern section of the Sunda mega thrust was the cause of the famous 2004 "South East Asian Tsunami". The third-strongest ever recorded earthquake with a magnitude of between 9.1 and 9.3 on the Richter scale and reverberation recorded as far as Alaska (West et al. 2005) caused a series of tsunamis waves over 30 meters high spread from the epicentre and hit the coasts of Thailand, Indonesia, India and Sri Lanka and, to a lesser extent, another ten countries (Paulson 2005). The fact that Indonesia lays between the Alpide Belt and the Pacific Ring of Fire, made this area particularly likely to be hit by earthquakes while the great distance travelled by the waves meant that the impact on the coast lines (and the ensuing damage and fatalities) took anything between fifteen minutes to over 15 hours (in the case of Somalia) to hit the shoreline (AFRC 2005). The longest faulting duration ever recorded by an earthquake (approximately 9 minutes) and the ensuing tsunamis cost the lives of up to 230,000 people. With an estimated death toll of over 130.000, Indonesia was the country worst affected by the tsunami. Sri Lanka (over 35,000 deaths), India (over 12,000 deaths) and Thailand (over 5.000) also suffered extremely high casualties. Somalia, Myanmar, the Maldives, Malaysia, Tanzania, the Seychelles, Bangladesh, South Africa, Yemen and Kenya were also affected with estimated fatalities that ranged between two and eighty-two (USGS 2010). Following the tsunami, over US$ 14 billion in humanitarian aid poured into the region from across the world and probably contributed to a

significant mitigation of the devastating effects of the tsunami (Jayasuriya and McCawley, 2010).

Figure 3.3.1. December 26th, 2004 South East Asian Tsunami quick reference table

| Date | Location | Event | Fatalities | Affected | Damage (US$) |
|---|---|---|---|---|---|
| 26/12/04 | S.E.Asia | Tsunami | 226,508 | 2,431,765 | 9,991,000,000 |

*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

### 3.4. India floods 24/07/2005

Exceptional torrential rains battered the Mumbai region between the 24th of July and the 2nd of August 2005. Although this part of India is used to heavy showers brought every summer by the Indian Monsoon, the precipitations of July 2005 registered new records: 994 mm of rain were recorded on July 26th alone and several near-records precipitations were recorded for all the following days. Aside from the metropolitan area of Mumbai, the areas of Khed, Chiplun, Khed, Raigad, Ratnagiri, Kalyan and Goa were also severely affected. Against precipitations of up to 994 mm per day, it is estimated that the Mumbai sewage system has a maximum carrying capacity of 25 mm per day: this was probably the key factor contributing to the flooding of the city (OCHA 2005). Torrential rains coupled with an overflowing of the sewage system had devastating consequences. It was reported that children were stranded in schools for over 24 hours, the Mumbai stock exchange could only partially function, airplanes were grounded and, as the water level kept raising, bodies of dead animals were found floating in the water thus raising significant health hazards (IFRC 2005). By early August 2005, the final (official) death toll was put at 1,259 fatalities and to this day, the expression "26th of July" has come to recall the devastation witnessed by Mumbai residents over those days.

Figure 3.4.1. July 24th, 2005 India (Mumbai area) floods quick reference table

| Date | Location | Event | Fatalities | Affected | Damage (US$) |
|---|---|---|---|---|---|
| 24/07/05 | India | Floods | 1,259 | 20,000,061 | 3,330,000,000 |

*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

### 3.5. Central America hurricane 01/10/2005

Although not the strongest hurricane of the 2005 Atlantic hurricane season (hurricane Wilma holds that honour), hurricane Stan caused far greater havoc than any other hurricane that hit the Central American region in 2005. The eleventh hurricane, sixth cyclone and eighteenth tropical storm, Stan was a relatively weak hurricane that hit southern Mexico, Guatemala and El Salvador in the first few days of October 2005 but that nevertheless managed to cause estimated damages worth US$ 3,9 billion and an estimated 1,598 fatalities. Originating off the coast of West Africa on September 17th, 2005, it was only while entering the Caribbean on October 1st 215 km southeast of Cozumel, Mexico, that Stan strengthened enough to be classified as Tropical Depression Twenty by the National Hurricane Centre (Pasch and Roberts 2006). Only a few hours after having been classified as Tropical Depression, the system suddenly intensified and was re-named as Tropical Storm Stan: it would have made his first landfall at 65 km/h at Punta Hualaxtoc, Mexico, just 55 km south of Tulum, Mexico. While crossing the Yucatan peninsula, Stan was upgraded to a category 1 hurricane on the Saffir-Simpson Hurricane Scale. A new landfall took place on October 4th with winds of above 130 km/h near Porta Roca, Mexico. By the time the torrential rains had ceased, Mexico and El Salvador had respectively reported 36 and 69 fatalities. Guatemala was the country worst hit by Stan: by the end of October 1,513 people were confirmed dead and estimated damages stood in the region of US$ 988,3 million (International Disaster Database, 2010). Due to the high number of victims that perished in the hurricane, the name Stan was permanently revoked from the official naming mechanism of the World Meteorological Organization.

Figure 3.5.1. October 1st, 2005 Central America hurricane quick reference table

| Date | Location | Event | Fatalities | Affected | Damage (US$) |
|---|---|---|---|---|---|
| 01/10/05 | Central America | Hurricane | 1,641 | 2,512,997 | 3,864,000,000 |

*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

### 3.6. Pakistan earthquake 08/10/2005

On October 8th, 2005 at 03:52:37 GMT (08:52:37 Pakistan Standard Time) an earthquake with magnitude 7.6 on the Richter scale with epicentre the town of Muzaffarabad (Pakistani-controlled Kashmir) was recorded. The United States Geological Survey (USGS) located the epicentre of the earthquake about 19 km northeast of Muzzaffarabad and 100 km north-northeast of Islamabad, while the hypocentre was located at a depth of 26 km below surface level (USGS 2005). Within a day from the original quake, a further 147 aftershocks were recorded. Of these, twenty-eight had a magnitude stronger than the original earthquake (USGS 2005). Emergency relief operations were made more difficult by the fact that most of the affected populations found themselves isolated from emergency relief teams (and food and water supplies) because mountain paths had been interrupted by mudslides. While some of the survivors attempted a long descent from the highest mountains in search of assistance, the Indian army and international organisations were attempting to "climb up" the mountain ranges to provide emergency assistance. NATO helicopters scrambled from Afghanistan were instrumental in establishing an airlift in order to provide airdrop of emergency supplies (BBC 2005). The earthquake that hit Kashmir was so strong that actually affected the altitude of a number of mountains in the Himalaya range (an area highly prone to earthquakes). At the time, the Pakistani authorities had put the estimated number of fatalities at 74,698 people (BBC 2005).

Figure 3.6.1. October 8th, 2005 Pakistan (Kashmir) earthquake quick reference table

| Date | Location | Event | Fatalities | Affected | Damage (US$) |
|---|---|---|---|---|---|
| 08/10/05 | Pakistan | Earthquake | 74,659 | 5,287,622 | 6,200,050,000 |

*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

### 3.7. Indonesia earthquake 27/05/2006

On May 27th, 2006 at 05:54 local time (22:54 GMT of the 26th of May), 10 km below the seabed, an earthquake of magnitude 6.3 on the Richter scale took place 20 km south-southwest of Yogyakarta, just off the cost of Java, Indonesia. Within the following 6 hours, two aftershocks of magnitude 4.8 and 4.6 on the Richter scale were also recorded (USGS 2006). The area most severely affected by the earthquake was Bantul where 3,580 fatalities and 1,892 injured were reported: not a surprising data when it appears that over 5 million people live within 50 km of the epicentre of the earthquake (GDACS 2011). The final total number of fatalities was set at 5,778, the total number of affected people was set at 3,177,923 and the total estimated damage was set at US$ 3,100,000.

Figure 3.7.1. May 27th, 2006 Indonesia (Java) earthquake quick reference table

| Date | Location | Event | Fatalities | Affected | Damage (US$) |
|---|---|---|---|---|---|
| 27/05/06 | Indonesia | Earthquake | 5,778 | 3,177,923 | 3,100,000,000 |

*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

### 3.8. India and Bangladesh cyclone 15/11/2007

The fourth storm of the 2007 North Indian Ocean cyclone season, Cyclone Sidr formed in the Bay of Bengal and made its landfall on the coast of Bangladesh on November 15th, 2007 with a speed of 260 km/h, thus easily making it into a category-5 tropical cyclone on the Saffir-Simpson Scale (Ball 2007). Preparations for the impacting cyclone were relatively adequate: 2 million people were evacuated from low-lying coastal areas to emergency shelters, weekly leave for government officials was withdrawn so that the full governmental apparatus could be mobilised to contribute to the coordination of the relief operations, all the country's ports and harbours were closed and 40,000 Red crescent volunteers were mobilised to provide emergency assistance and support. The work carried out by the Indian Meteorological Department seemed to have been fundamental in contributing to effectively coordinate the pre-impact preparations not only in India but also, and especially, in Bangladesh (IMD 2007). While under the Indian Cyclone Preparedness Program over 600,000 people that would have found themselves in the path of the storm were evacuated, the areas of Barguna and Patuakhali still suffered at least 423 and 385 fatalities respectively making them the worst-affected areas and contributing to a large proportion of the over 3,000 reported fatalities (Khan et al. 2007). The total number of fatalities was set at 4,250, the total number of affected people was set at 9,006,702 and the total estimated damage was set at US$ 2,400,000.

Figure 3.8.1. November 15th, 2007 Bangladesh Cyclone Sidr quick reference table

| Date | Location | Event | Fatalities | Affected | Damage (US$) |
|---|---|---|---|---|---|
| 15/11/2007 | Bangladesh | Cyclone | 4,250 | 9,006,702 | 2,400,000,000 |

*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

### 3.9. South Asia cyclone 02/05/2008

Originating on the 27th of April 2008 in the Bay of Bengal (1,150 km east-southeast of Chennai, India), Tropical Cyclone Nargis was first named by the Indian Meteorological Department (IMD) as such on on April 28th when located 550 km east of Chennai (IMD 2008). Subsequently, Nargis pointed northeast towards the Bay of Bengal and the coast of

Myanmar (Burma) with winds of up to 215 km/h, making it a category-4 cyclone. Nargis finally made its landfall on the Ayeyarwady district (Myanmar) at full strength at 12.00 UCT time on the 2nd of May 2008 (JTWC 2008). Nargis' devastating consequences were compounded by the actions of the country's ruling military junta. While on the 6th of May 2008 the military junta had officially requested the support of the United Nations in dealing with the aftermath of the catastrophe, the military rulers kept at the same time denying the necessary visas to aid workers to deliver the aid that was being made available (Denby 2008). It was only following the mediation of the Thai Prime Minister and the UN Secretary General Ban-Ki-Moon that finally, on May 19th; the military junta accepted the delivery of emergency aid provided by the Association of South East Asian Nations (ASEAN). Meanwhile, French, British and US ships that were carrying emergency relief supplies and that had been docked just outside Burma's territorial waters had been refused entry for days and were forced to leave the disaster zone without having delivered their emergency supplies (BBC 2008). The exact number of victims of the cyclone will never be known but is is most likely to have been much lower had the ruling military junta allowed international humanitarian assistance to enter the country immediately after the cyclone had struck. The final count for the Nargis cyclone that hit Burma in May 2008 saw a total of 138,434 fatalities, 3,209,389 affected people and an estimated US$ 4,019,000 in damages.

Figure 3.9.1. May 2nd, 2008 Bangladesh Cyclone Nargis quick reference table

| Date | Location | Event | Fatalities | Affected | Damage (US$) |
|---|---|---|---|---|---|
| 02/05/2008 | Burma | Cyclone | 138,434 | 3,209,389 | 4,019,000,000 |

*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

### 3.10. China earthquake 12/05/2008

The "Sichuan earthquake" struck at 14:28:01 Chinese Standard Time (CST) or 02:28:01 EDT on May 12th, 2008. The epicentre of the earthquake was located west-northwest of Chengdu (capital of Sichuan province) in the densely populated Wenchuan province. The focal depth of the earthquake was 19 km and the magnitude registered on the Richter scale was 7.9 (USGS

2008). The earthquake took place along the Longmenshan fault line on the border between the Indio-Australian plate and the Eurasian plate, it lasted approximately two minutes and it propagated at the speed of 3.1 km per second. 104 major aftershocks ranging in intensity between 4.0 and 6.1 were recorded within 72 hours of the main quake (Chinese earthquake administration 2008). Although following the last two decades of sustained economic development the search and rescue services of the Republic of China have tremendously improved in terms of speed and efficiency, the total death toll resulted very high due to the high population density in the earthquake-stricken areas. The estimated damage was extremely high due to the fact that major buildings and infrastructures in urban areas (as opposed to rural areas) had been affected. Within the Sichuan region, the provinces of Mianyang, Ngawa and Deyang were the worst affected ones with the number of fatalities set at 21,963, 20,258 and 17,121 respectively (Sina 2008). The total number of fatalities was set at 87,476 individuals, the total number of people affected at 45,976,596 and and the estimated damage at US$ 85,000,000.

Figure 3.10.1. May 12th, 2008 Sichuan (China) earthquake quick reference table

| Date | Location | Event | Fatalities | Affected | Damage (US$) |
|---|---|---|---|---|---|
| 12/05/2008 | China | Earthquake | 87,476 | 45,976,596 | 85,000,000,000 |

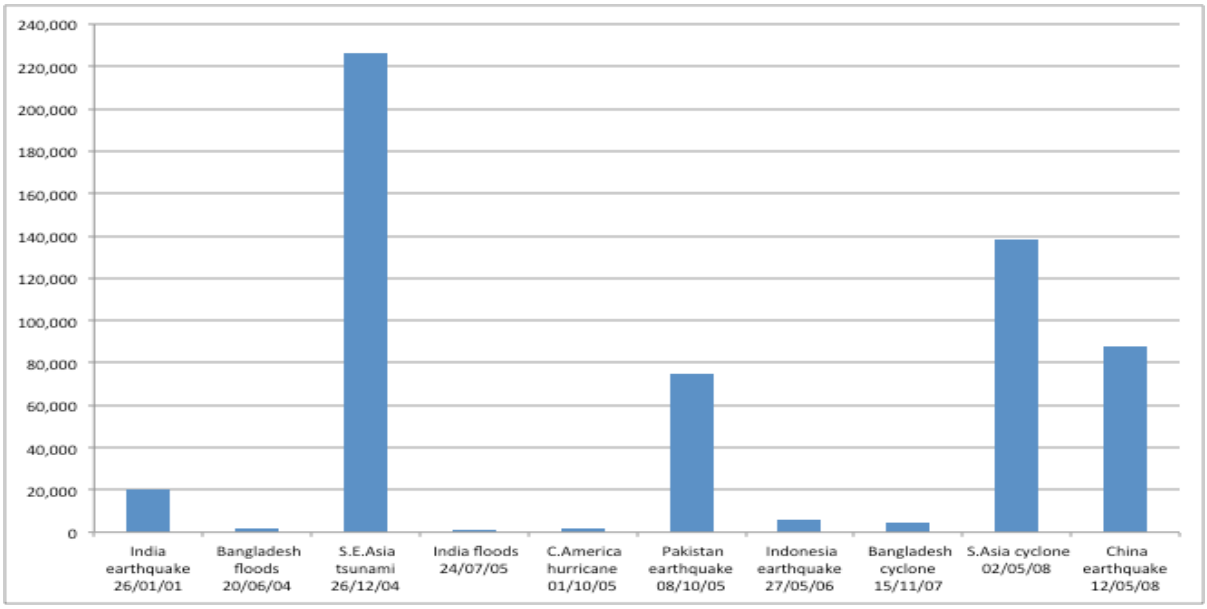
*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

### 3.11. Comparative data analysis

While so far the data concerning each of the ten natural disasters under investigation has been presented individually, the following three graphs and one table present the data on the natural disasters investigated through a comparative perspective. Data concerning the magnitude of the ten natural disasters under investigation is presented here in a comparative manner for both theoretical and analytical reasons. Indeed, while this dissertation investigates the ten biggest natural disasters for the period of analysis, the ten catastrophes under analysis are characterised by significant variation in terms of the number of fatalities, people affected and estimated damages reported. Therefore, it is appropriate to present the data in a comparative

perspective so as to eventually be able, at a later stage, to identify particular patterns of disbursement in relation to these characteristics. The following three graphs present the total number of fatalities, the total number of affected people and the total estimated damages recorded for each natural disaster under investigation respectively. Finally the table summarises all the data provided for all the analysed catastrophes.

Figure 3.11.1. Total number of fatalities recorded for each natural disaster




*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

Figure 3.11.1 highlights the total number of fatalities that were recorded for each of the ten humanitarian catastrophes under investigation. The earthquake and resulting tsunami that struck South East Asia on the 26$^{th}$ of December 2004 is by far the catastrophe that registered the highest number of fatalities. On this occasion, 226,508 people lost their lives and almost all of them on the day of the tsunami itself. This sets this disaster aside from other catastrophes such as floods, hurricanes or earthquakes where a significant number of people are likely to loose their lives not on the day of the catastrophe itself but in the following days as result of the conditions created by the catastrophe (spread of infectious diseases, lack of water and food and loss of shelter).

The cyclone that struck South Asia on the 2$^{nd}$ of May 2008 is the natural disaster that caused the second-highest number of fatalities among the natural disaster investigated. While a significant number of individuals lost their lives directly as result of the cyclone, the majority

of the fatalities that took place were to be attributed to events that followed the cyclone itself. The events that too place could be divided between natural and man-made. Natural events have to do with the rapidly deteriorating conditions that developed following the cyclone: lack of potable water, spread of diseases due to the overflowing of poorly maintained sewage systems and the loss of income and food due to the destruction of rice fields. Yet, a significant number of deaths following the cyclone that hit Burma in May 2008 can be traced also to what could be seen as man-made humanitarian disasters. Following the catastrophe itself, the ruling Burmese military junta for a number of days refused any kind of international assistance and did not openly acknowledge the sheer magnitude of the calamity that had hit the country. When the junta finally allowed foreign assistance to flow into the country, it did so in a slow, inconsistent and very selective manner, still refusing significant aid and support. The actions of the junta are therefore likely to be at least partly responsible for the 138,434 victims recorded following the devastating landfall of cyclone Nargis on the southern coast of Myanmar.

The third and fourth catastrophes with the highest numbers of fatalities recorded are the Sichuan earthquake of May 2008 and the October 2005 Kashmir earthquake. The 87,476 fatalities registered for the Chinese earthquake of May 2008 are primarily due to the fact that the affected areas were densely inhabited and semi-urbanised: the collapse of buildings and infrastructures caused the majority of the fatalities. The 74,659 fatalities recorded for the Kashmir earthquake were to be found primarily in rural and mountainous areas. Entire communities found themselves cut off the relief effort and had to improvise themselves rudimentary search and rescue operations. The topography of the region and the difficulties registered in reaching the affected populations are one of the primary causes for the high number of fatalities.

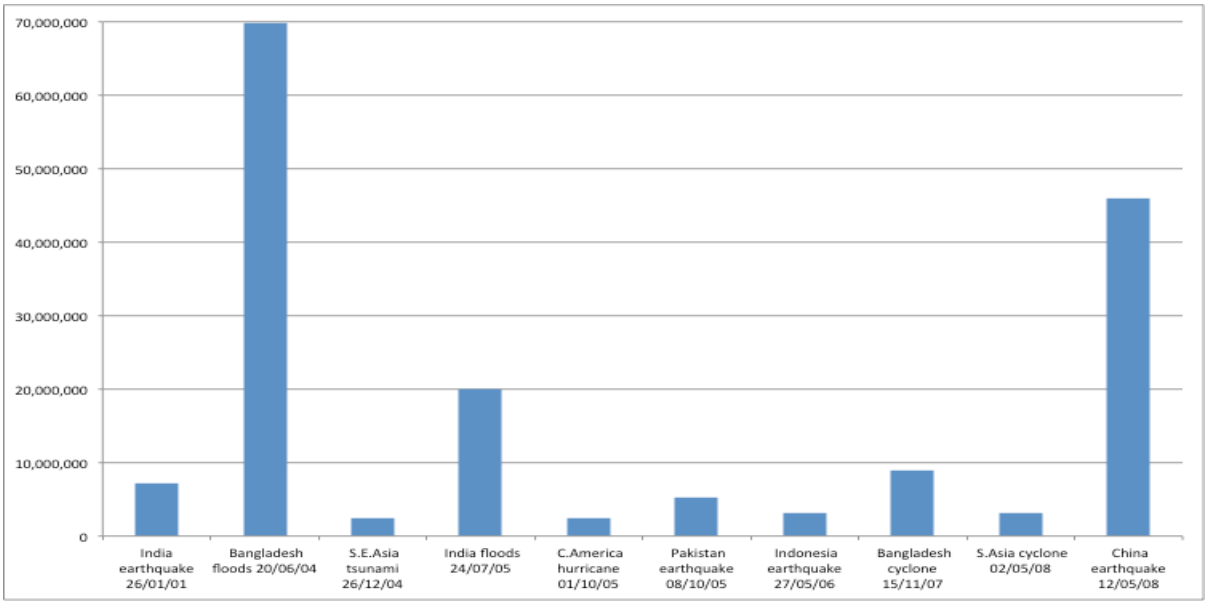
The earthquake that struck Gujarat (India) in January 2001 caused 20,023 victims. While the strength of the quake was the primary cause of the high number of victims, two additional reasons for the high number of fatalities can be found both in the absence of anti-seismic provisions in the construction of buildings and in the fact that the regional and densely-populated capital of Ahmedabad was struck by the quake: hundreds of lives were lost in this city alone.

While certainly not less tragic, the number of victims in the other examined catastrophes is significantly lower: 5,778 fatalities were registered in the May 27$^{th}$ 2006 Java earthquake, 4,250 lives were lost due to cyclone Sidr in Bangladesh in November 2007, 1,677 were taken

by the floods that hit Bangladesh in June 2004, 1,641 lives were lost as result of hurricane Stan in October 2005 and, finally, 1,259 fatalities were recorded following the floods that hit India in July 2005.

While one might expect immense variation in the total number of fatalities due to different natural catastrophes, it is particularly interesting to observe that the number of fatalities is by no means necessarily proportional to the number of affected people by that very same catastrophe: natural catastrophes might record extremely high number of victims but relatively low numbers of people affected and vice-versa. A point this, that is clearly illustrated by the next graph that takes into account not the number of fatalities per catastrophe but, rather, the total number of people affected by each selected catastrophe.

Figure 3.11.2. Total number of affected individuals recorded for each natural disaster




*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

Figure 3.11.2 highlights the total number of people that have been affected by each one of the catastrophes that have been selected for investigation. The term ”affected people” refers to all those individuals that, while not having lost their lives, have nevertheless been injured, have lost their home, have lost their primary source of income or whose lives have been severely disrupted by a natural catastrophe. What immediately becomes apparent is the fact that the data recorded for the South East Asian Tsunami and the June 2004 Bangladesh floods are almost reversed. While in the previous graph the number of fatalities reported for the

Bangladesh floods was minimal compared to the total number of fatalities reported for the South East Asian Tsunami, in this graph the number of affected people in the June 2004 Bangladeshi floods is incomparably higher than the number of people affected by the December 2004 South East Asian Tsunami. The reasons for this only apparent discrepancy are to be found in the fact in the different nature of the two catastrophes. The December 2004 tsunami was a sudden catastrophe that struck with no warning whatsoever: those that were along the hit coastal areas had no warning and almost no opportunity to seek safety: many of the victims were caught by surprise by the tsunami while still asleep. This is the key reason why the number of fatalities was so high. The number of affected people, on the other hand, was relatively low in that the earthquake produced itself in the middle of the Indian Ocean and that the tsunami only hit coastal areas. While some of these coastal areas were densely populated (and the overwhelming part of the population lost their lives), many other coastal areas were either non-inhabited or sparsely populated. That is the reason why only relatively few people were recorded as affected by the tsunami: individuals were more likely to be either non-affected or to outright loose their lives.

The reason why the number of affected people by the June 2004 Bangladesh floods is so high is diametrically the opposite. While extensive flooding can up to a certain extent be predicted, there is very little that can be done to avoid it (at least on the short-term without long-term preparedness programmes). The warnings and the forecasting of the incoming floods offered an opportunity for the authorities to evacuate the population and to organise emergency relief operations in advance of the floods, thus saving tens of thousands of lives. On the other hand, however, the number of people affected was always bound to be very high because of the morphology of the country: Bangladesh is a low-laying flood-prone area criss-crossed by a variety of river basins and river systems: an exceptional percentage of the population was therefore bound to be affected by the floods. While “only“ 2,431,765 people were affected by the December 2004 South East Asian tsunami, a staggering 69,808,532 people were affected by the floods that hit Bangladesh (and marginally India) in June 2004.

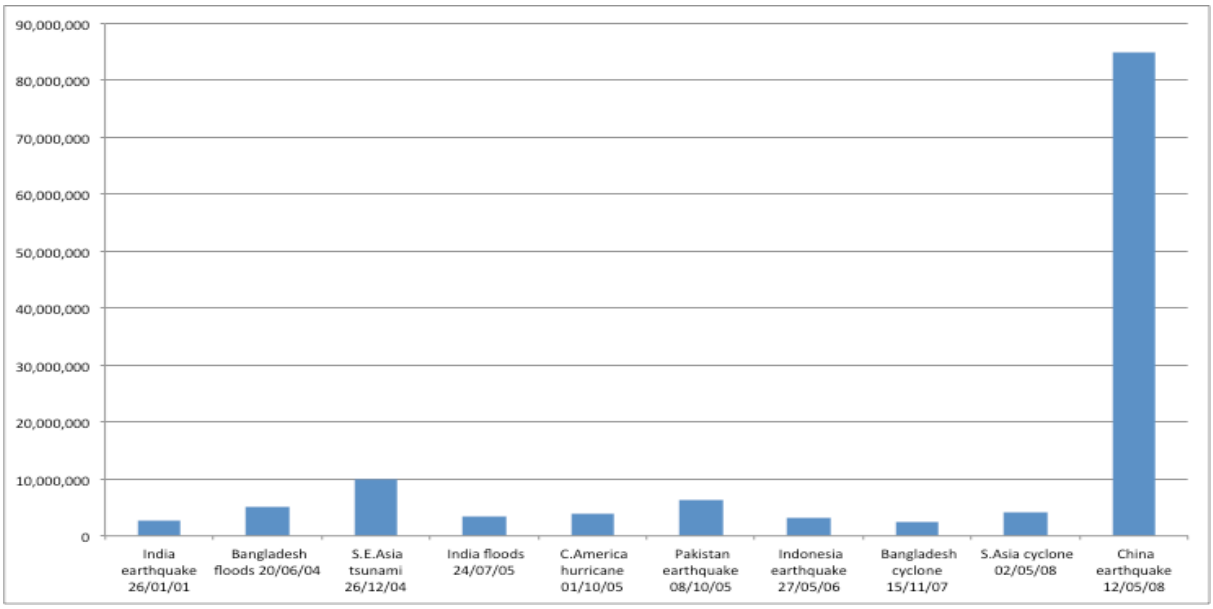
The Sichuan earthquake that shook China in May 2008 recorded the second-highest number of affected people among the natural catastrophes under investigation: 45,976,596 people were affected by the quake. The area worst hit by the Sichuan earthquake was Wenchuan province: a densely populated area just northwest of Chengdu, the capital of Sichuan. The fact that Chengdu province is home to various urban centres (Chengdu being just the largest one) coupled with the fact that anti-seismic provisions were not incorporated in the construction

plans for most of the existing buildings made it most likely to have an extremely high number of affected people.

The floods that struck India in July 2005 affected 20,000,061 individuals. Again, a similar explanation to the one envisioned in the case of the June 2004 Bangladeshi floods can be employed: while the total number of victims was relatively low thanks to the work of the emergency services and the fact that the floods could be predicted, a high number of people were affected in the city of Mumbai and the densely-populated surrounding region. Cyclone Sidr that struck Bangladesh in November 2007 and the earthquake that hit Gujarat (India) in January 2001 affected 9,006,702 and 7,236,304 people respectively. On the one hand, the reason for the high number of people affected by cyclone Sudr can be found in the fact that, while making its landfall on the coast, Sidr proceeded inland as far as the Burmese border across densely-populated regions. The reasons for the high number of affected people in the Gujarat earthquake, on the other hand, are to be found in the high population density and in the fact that the regional capital of Ahmedabad (over 5 million inhabitants) was affected by the earthquake.

The remaining five natural catastrophes under investigation recorded a number of affected people always around or well below 5,000,000 people. The number of affected people was 5,287,622 for the Pakistani earthquake of the 8$^{th}$ of October 2005, 3,177,923 for the Java earthquake of June 2006, 3,209,389 for cyclone Nargis on Myanmar in May 2008, 2,431,765 for the South East Asian tsunami of December 2008 (as mentioned before) and, finally, 2,512,997 when hurricane Stan struck Central America in October 2005.

Figure 3.11.3. Total estimated damage recorded for each natural disaster (US$)




*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

Figure 3.11.3 highlights the total estimated damage recorded for each of the ten natural disasters under investigation. One catastrophe stands above all the other ones in this respect: the Sichuan earthquake that shattered China on the 12th of May 2008. In this instance, the estimated total damage was a staggering US$ 85 billion, an amount many times higher than the ones of recorded by any of the other natural catastrophes under investigation. The location of the earthquake is one of two fundamental reason for such an outcome: the epicentre of the quake was located in the Wenchuan province, less than 100 km northwest of Chengdu, a sprawling city of over 11 million people and capital of Sichuan province. Urban areas were therefore strongly affected by the earthquake: the damage to infrastructure, buildings, roads, sewage systems and industry was substantial.

The second important factor that contributed to the stellar estimated damages for the Sichuan earthquake is the relative wealth of the region. If it is undeniable that a significant gap in terms of wealth still persists between Chinese coastal areas and the inland provinces, it is also clear that over the last two decades China underwent an impressive economic transformation. As result of this economic development not only wealth was accumulated in the form of more luxurious homes, cars and offices but also in the shape of insurance policies: the costs of refinancing insured property in the affected regions is a specificity of China when compared

to the other investigated catastrophes. The extremely high estimated damages that were recorded as result of the May 2008 Sichuan earthquake are therefore to a great extent to be attributed to the fact that this was a "catastrophe of the wealthy" that affected a relatively rich and economically developed area.

While all other natural disasters under investigation recorded significantly lower total estimated damages, two catastrophes still stand out compared to the remaining ones: the December 2004 South East Asian tsunami and the October 2005 Kashmir earthquake. The tsunami that struck much of South East Asia (and beyond) in December 2004 caused estimated damages for almost US$ 10 billion: an exorbitant financial cost but still a relatively limited one in the broader context of the number of fatalities recorded on that fateful day. The reasons for such a relatively low financial cost are to be found in the fact that, although the tsunami struck up to fourteen countries surrounding the Indian Ocean, no major cities were hit. Also, while many coastal areas were affected, many of these were uninhabited. The communities and populations that were directly hit by the tsunami were in the overwhelming majority of cases rural communities and fishermen's villages characterised by subsistence farming, local fishing and very low household incomes. Last but not least, the fact that the epicentre of the earthquake was in the middle of the Indian Ocean meant that the damage caused was much more contained than had the epicentre been located inland.

The earthquake that struck Pakistani-controlled Kashmir on the 8$^{th}$ of October 2005 caused an estimated damage of over US$ 6 billion. Once again, while this was certainly a tremendous financial blow to a country such as Pakistan, the total estimated damages were relatively low when compared with the total number of fatalities registered for the same catastrophe. The key reason for such an outcome is to be found in the fact that Kashmir is a very poor region characterised by extremely low household incomes, minimal infrastructure (indeed, emergency relief operations following the quake were chronically hampered by the absence of decent roads) and with few urban centres. At the same time, Kashmir is one of the areas with the lowest population density in the whole of central and northern Pakistan and that contributed to account for the relatively low total estimated damages. The three natural disasters that recorded the highest number of estimated damages were therefore all earthquakes (including the December 2004 tsunami).

Each of the remaining seven natural catastrophes under investigation registered total estimated damages of around or below US$ 5 billion. The estimate for the June 2004 Bangladesh floods was US$ 5,073,700,000, the estimated damage from tropical cyclone

Nargis (Myanmar) was US$ 4,019,000,000, that for the damage sustained by Central American countries because of hurricane Stan in October 2005 was US$ 3,864,000,000, the floods that affected western India in July 2005 caused estimated damages for US$ 3,330,000,000, the earthquake that struck Java (Indonesia) in May 2006 recorded estimated damages for a total of US$ 3,100,000,000 while the earthquake that shook India in January 2001 recorded damages for a total of US$ 2,623,500,000. Finally, cyclone Sidr that struck Bangladesh in November 2007 caused a total estimated damage of "only" US$ 2,400,000,000.

Figure 3.11.4. Comparative summary of all humanitarian catastrophes under investigation

| Date | Location | Disaster | Fatalities | Affected | Damage (US$) |
|---|---|---|---|---|---|
| 26/01/01 | India | Earthquake | 20,023 | 7,236,304 | 2,623,500,000 |
| 20/06/04 | Bangladesh | Floods | 1,677 | 69,808,532* | 5,073,700,000 |
| 26/12/04 | S. E. Asia | Tsunami | 226,508* | 2,431,765 | 9,991,000,000 |
| 24/07/05 | India | Floods | 1,259 | 20,000,061 | 3,330,000,000 |
| 01/10/05 | C. America | Hurricane | 1,641 | 2,512,997 | 3,864,000,000 |
| 08/10/05 | Pakistan | Earthquake | 74,659 | 5,287,622 | 6,200,050,000 |
| 27/05/06 | Indonesia | Earthquake | 5,778 | 3,177,923 | 3,100,000,000 |
| 15/11/2007 | Bangladesh | Cyclone | 4,250 | 9,006,702 | 2,400,000,000 |
| 02/05/2008 | Burma | Cyclone | 138,434 | 3,209,389 | 4,019,000,000 |
| 12/05/2008 | China | Earthquake | 87,476 | 45,976,596 | 85,000,000,000* |

*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

Figure 3.11.4 summarizes in a comparative manner the total number of fatalities, affected people and estimated damages for all the ten natural disasters under investigation. While all numbers provided are, inevitably, only estimates of the totals, the table provides a clear insight for what concerns the magnitude of each of the investigated natural disasters. For the chosen period of analysis (January 1st 2000 to December 31st 2008) only humanitarian catastrophes that recorded at least 1,000 fatalities, 1,000,000 affected people and US$ 1,000,000,000 in damages were selected. Among the ten natural disasters under investigation, the catastrophe that recorded the highest number of fatalities was the South-East Asian tsunami of the 26th of December 2004. The natural disaster that recorded the highest number of affected individuals was the Bangladesh floods of the 20th of June 2004. Finally, the humanitarian catastrophe that recorded the highest estimated damages was the Sichuan earthquake (China) of the 12th of May 2008.

## 4. Data analysis and empirical results

While the concluding chapter of this dissertation will provide an overview of the empirical findings by presenting them according to the three research hypotheses under investigation, this fourth chapter limits itself to present the data analysis for the examinated case studies and to provide a short summary of the major findings obtained in each instance. In order to do so, data is initially presented in a comparative perspective for all donor countries combined. Subsequently, data is presented for each donor country individually.

### 4.1. All donor countries combined

This first part of the chapter dedicated to the data analysis and the presentation of the empirical results concentrates on the output obtained for all donor countries combined. Data is therefore obtained and presented through a number of steps. To begin with, the multiple regression analysis of all the investigated independent variables against disbursements of humanitarian assistance is presented. This is done at the very beginning of the chapter so as to explicitly highlight the superior explanatory value of multivariate results vis-à-vis bivariate findings. As a second step, the dependent variable is investigated in more detail by introducing three graphs concentrating on the data available for the disbursements of humanitarian assistance. The introduction of these three graphs at an early stage within the chapter is justified due to the peculiar role played by the single dependent variable under investigation as opposed to the various independent variables which are tested against it. As a third step, a graph for the independent variable pertaining to the total number of fatalities recorded for each natural disaster is introduced. This graph is presented so as to provide a clearer picture of the independent variable that, according to the multiple regression analysis, most influences the dependent variable. Finally and having taken the steps presented above, a last graph highlights the dynamic interactions taking place between the two variables presented above: the one pertaining to the disbursemnets of humanitarian assistance and the one made up by the number of fatalities recorded for each natural disaster under investigation. For the sake of academic rigour as well as to systemaically explore the correlation between the investigated variables, data and findings pertaining to all selected case studies are always presented in the same order and format.

Figure 4.1.1. Multiple regression analysis for all the independent variables

Number of observations=1470
Time periods=70

| log_disburse | Coef. | Std. Err. | P>\|z\| |
|---|---|---|---|
| unitedkingdom | 0.314 | 0.094 | 0.001 |
| italy | 0.211 | 0.077 | 0.006 |
| netherlands | 0.029 | 0.029 | 0.326 |
| spain | 0.116 | 0.059 | 0.050 |
| france | 0.340 | 0.122 | 0.005 |
| germany | 0.259 | 0.085 | 0.002 |
| gdpus | -0.402 | 0.139 | 0.004* |
| catastroph~y | -0.057 | 0.018 | 0.001* |
| clgovernment | 0.009 | 0.016 | 0.543 |
| election | -0.025 | 0.034 | 0.464 |
| fatalities | 0.164 | 0.023 | 0.000* |
| affected | -0.031 | 0.020 | 0.130 |
| damage | 0.023 | 0.023 | 0.326 |
| totarticles | 0.000 | 0.041 | 0.990 |
| _cons | 0.082 | 0.039 | 0.033 |

*Key:*

*log_disburse: Logarithmic disbursement (dependent variable)*

*unitedkingdom: United Kingdom (dummy variable)*

*italy: Italy (dummy variable)*

*netherlands:The Netherlands (dummy variable)*

*france:France (dummy variable)*

*spain:Spain (dummy variable)*

*germany:Germany (dummy variable)*

*gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation*

*catastroph˜y: Catastrophe day (days elapsed since the onset of a selected natural disaster)*

*clgovernment: Centre-left government (presence or not of centre-left parties in government)*

*election: Election (presence or not of electoral period in the donor country)*

*fatalities: Fatalities (number of fatalities recorded for natural disaster under investigation)*

*affected: Affected (number of people affected by the natural disaster under investigation)*

*damage: Damage (estimated damages recorded for the natural disaster under investigation)*

*totarticles: Total articles (total articles recorded on the natural disaster under investigation*

*_cons: Constant*

*Source: the author.*

Figure 4.1.1 shows the results for the Multiple Regression Analysis (MRA) with Generalised Least Squares (GLS) carried out for all countries combined over 1470 days of analysis (i.e. the 210 days investigated for each donor country).

A P > z value of almost 0.004 for the variable accounting for gross domestic product, a P > z value of 0.001 for the number of days that have elapsed since the onset of a catastrophe and a P > z value of 0.000 for the number of fatalities recorded, highlight the fact that in all these instances there is an almost 100% probability that these independent variables have an effect on the amount of emergency humanitarian aid disbursed. Conversely, such results highlight the fact that there is an almost 0% likelihood that the obtained value is the result of random distribution. Unsurprisingly, most of the six dummy variables that have been included for the statistical model that investigates all countries combined also show highly significant P > z values. Indeed, the values recorded for the variables identified as "unitedkingdom", "italy", "france" and "germany" are all almost 0.000 while the P > z value recorded for the variable "spain" is 0.050. Unlike the other five dummy variables, the one identified as "netherlands" records a non-significant P > z value of 0.326. Within this context, the empirical values obtained for the dummy variables can be interpreted by comparing them against the constant. In the case of this multiple regression analysis involving all donor countries combined, all dummy variables except the one pertaining to the Netherlands are therefore statistically significant.

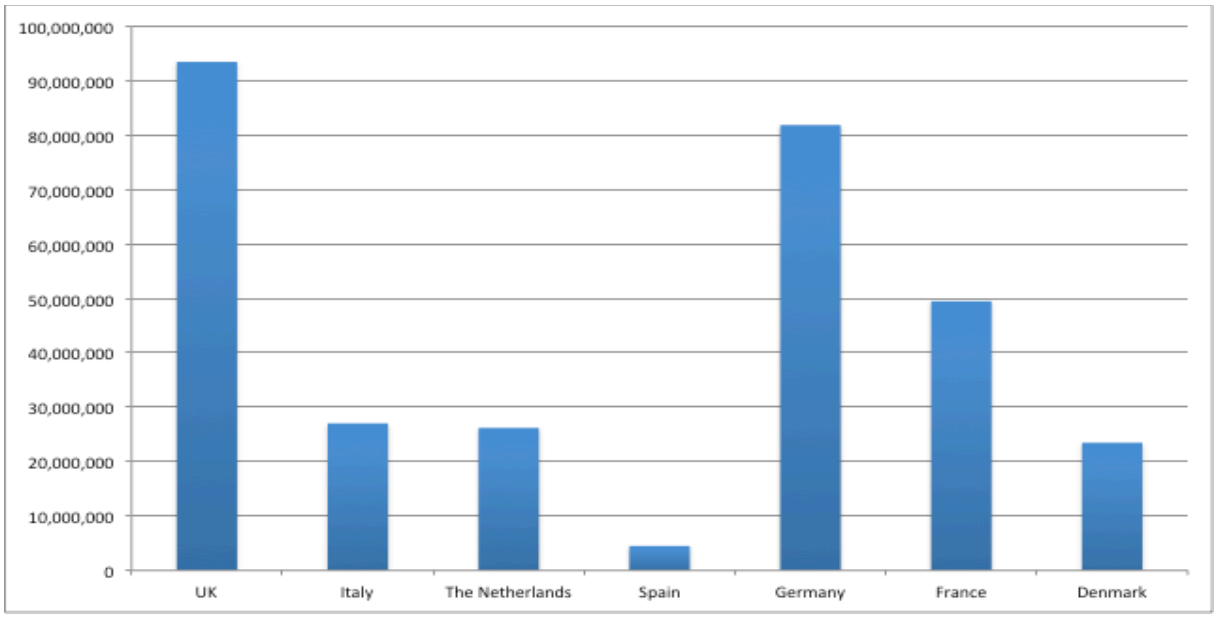
While the P > z value shows the significance of the variable, the absolute value of the coefficient shows its amount of influence. In this case and once the dummy variables are excluded, the independent variables with the coefficients with the highest absolute values are those ones accounting for the donor countries' gross domestic product (-0.402) and the number of fatalities recorded (0.164). While displaying a significantly smaller coefficient (-0.057), the fact that the variable concerned with the number of days that have elapsed since the onset of a natural disaster displays a negative coefficient should be no cause for concern. Indeed, such an outcome is entirely logical in that it highlights that, as the number of days that

have elapsed since the onset of a natural disaster increase, the disbursements of emergency humanitarian assistance decrease. As results of what has been mentioned above and once the dummy variables are excluded, the most significant independent variables in determining the amount of humanitarian aid disbursed are therefore the number of fatalities recorded, the number of days that have elapsed since the onset of a catastrophe and, to a more limited extent, the size of the donor countries' gross domestic products. In relative terms when assessed vis-à-vis the other standardized independent variables, the effect of the number of fatalities could therefore be assessed as very large with the exception of the dummy variables and the predictor pertaining to the donor countries' gross domestic product. Indeed, one standard deviation increase in the total number of fatalities results in 0.164 standard deviation increase in the disbursement of emergency humanitarian assistance.

Having said that, multicollinearity within the regression is checked for by computing for the tolerance value and by regressing one of the explanatory variables on all other explanatory variables. In this multiple regression, multicollinearity is recorded for the gross domestic product independent variable as well as for four out of six of the dummy variables. While the presence of multicollinearity for the dummy variables is to be expected and is no cause for concern, three key considerations shall be made in relation to the variable accounting for all donor countries' gross domestic products. To begin with, the presence of multicollinearity for the variable made up by the gross domestic product is to be expected. That is the case because there is very little variation in the variable itself, because dummy variables have been included and because almost no residual variation can be detected. Having said that and given the fact that the individual (i.e. country specific) multiple regressions do not need to include any dummy variables, the gross domestic product variable is expected not to experience multicollinearity problems when tested for each individual donor country as opposed to all donor countries combined. Secondly, the high standard error is likely a cause of the multicollinearity and the model might be overfitting, such that more data would be required to obtain a more reliable estimate. Because of that, the value for this variable might be unreliable. Finally, the negative coefficient recorded for the gross domestic product variable is cause for concern. Indeed, such a negative coefficient would seem to imply that, as a donor country's gross domestic product increases, the amount of humanitarian assistance provided by the donor country in question decreases. In light of the three considerations made above, one should not take for granted the apparent significance of the gross domestic product variable but, rather, should assess its significance also in light of the results obtained for the individual case studies under investigation.

In light of the points highlighted above, a few final considerations can summarize the findings obtained for all donor countries combined through the multiple regression analysis. To begin with, the number of fatalities recorded in a natural disaster is by far the most significant factor affecting the extent to which a donor government might provide emergency humanitarian assistance to a country struck by a sudden natural disaster. In other words, the greater the number of fatalities recorded, the greater the amount of humanitarian assistance provided. Secondly, the number of days that have elapsed since the onset of a natural disaster is also a significant factor influencing the extent to which emergency humanitarian assistance might be disbursed. Indeed, the evidence suggests that, as the number of days since the onset of a natural disaster increases, the amount of humanitarian assistance disbursed tends to decrease. Finally, while the evidence overwhelmingly confirms the hypothesis according to which the magnitude of a natural disaster is highly significant in influencing the extent to which a donor government might be ready to provide emergency humanitarian assistance to a country struck by a sudden natural disaster, the same evidence suggest that the domestic politics of the donor country in question are not significant in influencing disbursements of humanitarian assistance.

Figure 4.1.2. Disbursement for all investigated catastrophes per donor country (US$)

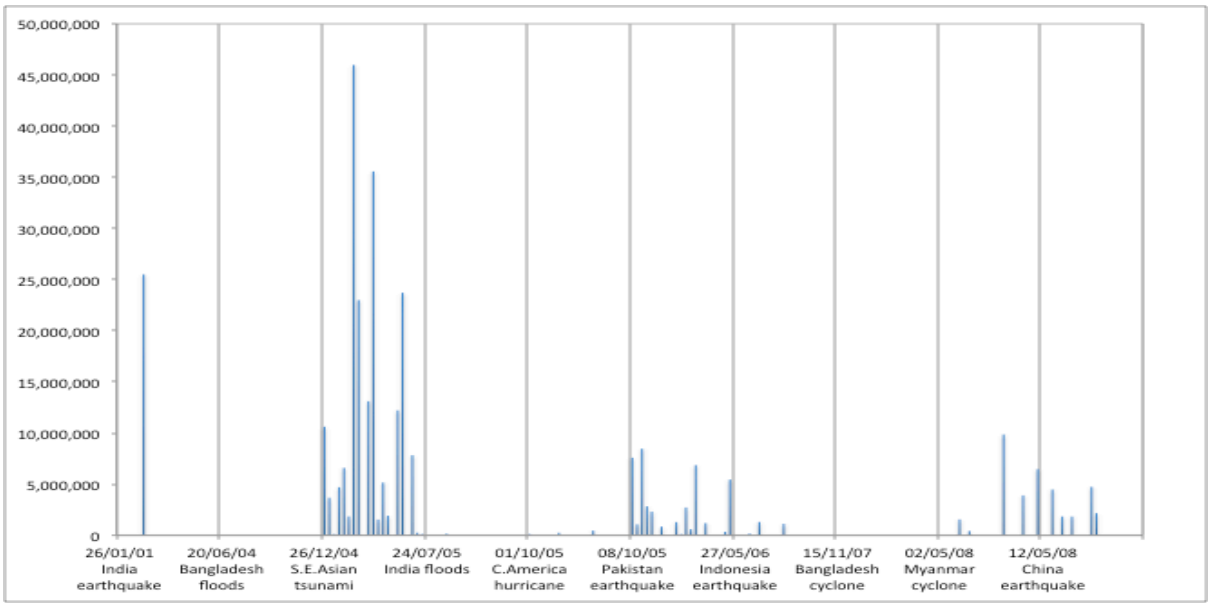



*Source: the author on elaborations from the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA).*

Figure 4.1.2 illustrates the total amount of disbursements of emergency financial assistance provided by each donor country for the ten largest humanitarian disasters that took place within the January 1st 2000 to December 31st 2008 period of analysis.

By looking at the graph, the remarkable performance of the United Kingdom becomes immediately apparent: despite an economy significantly smaller that that of Germany and comparable to that of France in terms of absolute GDP, the United Kingdom outperforms both of its continental partners with an expenditure of over US$ 90,000,000. On the other hand, with an economy significantly larger than that of the United Kingdom, Germany only manages to provide just above US$ 80,000,000 in emergency financial assistance. France, with an economy of comparable size to that of the United Kingdom but an expenditure of just below US$ 50,000,000, only musters barely more than half of the contribution provided by the United Kingdom. Given the fact that its economy is of a comparable size to those of both the United Kingdom and France, Italy performs particularly poorly with an expenditure of approximately US$ 28,000,000: that is equivalent to roughly half the expenditure of France and to one third of the expenditure of the United Kingdom. With an expenditure hovering around US$ 25,000,000, both The Netherlands and Denmark post an impressive performance when compared to their peers. While their economies are puny in comparison to those of France and Italy, both The Netherlands and Denmark contribute half of the expenditure of France and even match the expenditure of Italy. Finally, Spain performs particularly poorly in terms of the provision of humanitarian aid for the ten humanitarian crises under investigation: with an economic size in between Italy and The Netherlands, Spain only manages to provide a tiny fraction of the emergency financial assistance provided by its fellow European Union's member states (US$ 5,000,000).

Figure 4.1.3. Disbursements for the period of analysis (US$) for all donors combined




*Source: the author and elaborations from the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA).*

Figure 4.1.3 illustrates the total amount of emergency financial assistance provided by all donor countries under investigation combined throughout the whole period of analysis (January 1st 2000 to December 31st 2008).

As it becomes immediately apparent, the tsunami of December 26th, 2008 is the natural disaster that received by far the greatest amount of emergency financial assistance among all natural disasters investigated in the sample. While the fact that the donors under investigation provided over US$ 45,986,132 in emergency relief for the victims of the tsunami in one single day is in itself outstanding, what is even more exceptional is the total amount of emergency financial aid that was provided over the entire three weeks following the disaster itself. In the three weeks following the tsunami of 26th of December 2004, the seven donor countries under investigation provided US$ 197,859,730 in emergency financial assistance as recorded through the Office for the Coordination of Humanitarian Affairs' Financial Tracking System (FTS). The day of the tsunami itself saw disbursements for a total of US$ 10,617,179 and, aside from the peak of US$ 45,986,132 mentioned earlier, five other days saw total disbursements of over US$ 10,000,000 as well. Throughout the three weeks following the tsunami, only 3 days saw no financial disbursements to the benefit of the victims of the tsunami coming from the seven donor countries under investigation. Indeed, the victims of the

tsunami received therefore not only substantial but also prolonged assistance from the seven EU member states under investigation.

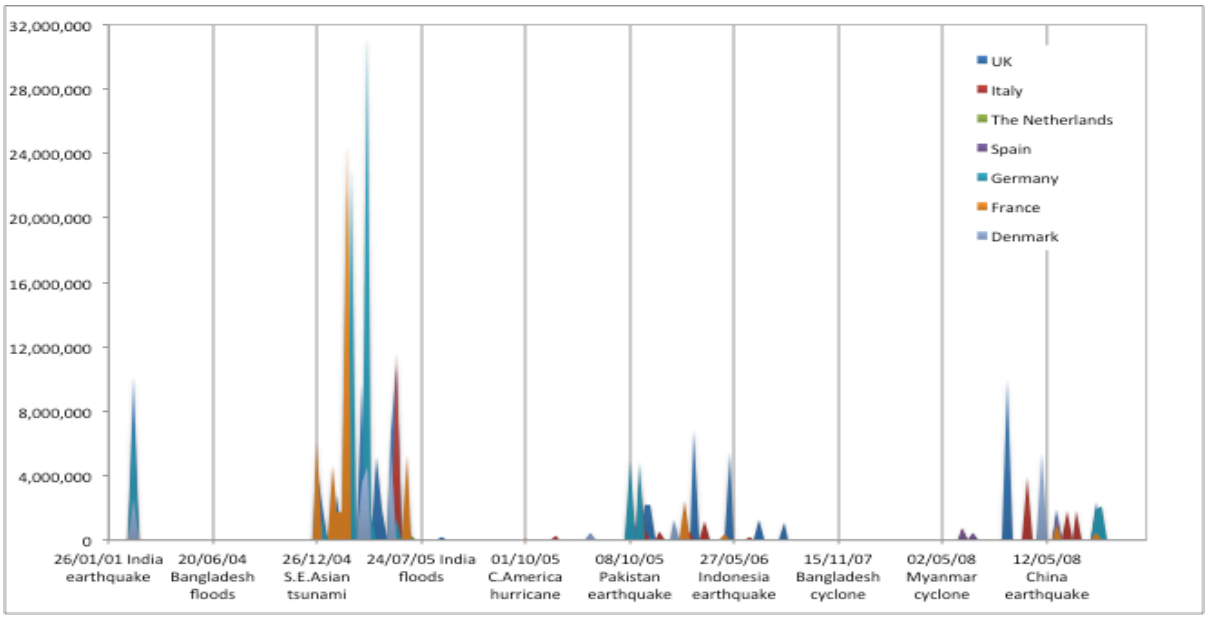
A second catastrophe that stands out in terms of the quantity of emergency financial assistance received by the affected population in one single day is the Gujarat earthquake (India) of January 26th, 2001. The seven donor countries under investigation provided over US$ 25,000,000 to the victims of this calamity as recorded by OCHA's Financial Tracking System making it the third natural disaster to receive the most emergency financial assistance within the nine-year period of analysis in this study. A word of caution is nevertheless in order at this point for what concerns the provision of humanitarian aid on the occasion of the Gujarat earthquake: while the data for what concerns the total amount of financial assistance provided is in as far as possible correct, not the same can be said for its timing. Research carried out on tabulates of the Financial Tracking System (FTS) of the UN Office for the Coordination of Humanitarian Affairs (OCHA) has highlighted a situation whereby all donor countries under investigation that reported having provided emergency financial assistance to the victims of the January 2001 Gujarat earthquake, reported doing so on the 31st of January 2001 only. This should lead to use some caution when analysing the data in that it seems unlikely that all donor countries should provide emergency financial assistance on exactly the same day for the same catastrophe. What is likely to have happened is that emergency financial disbursements might have taken place on a number of different days but have been reported on a set date as the result of administrative requirements on behalf of the Office for the Coordination of Humanitarian Affairs. However, disregarding the potential exact timing of the financial assistance provided to the victims of the Gujarat earthquake, it is safe to claim that this was indeed the natural disaster that received the third largest amount of emergency financial assistance from the combined seven donor member states under investigation within the whole nine-year period of analysis.

Aside from the December 26th, 2004 tsunami and the January 26th, 2001 Gujarat earthquake, at least three other humanitarian catastrophes among those under investigation received substantial emergency financial assistance from the seven EU member states under scrutiny. The victims of the earthquake that shattered Pakistani-controlled Kashmir on the 8th of October 2005 received emergency humanitarian assistance to the tune of US$ 41,737,091 over the three weeks following the quake itself. Within these three weeks, four days clearly stand out as particularly significant in that over US$ 5,000,000 were donated in each of them. The provision of emergency financial assistance to Pakistan following the October 2005

Kashmir earthquake was both speedy and sustained over the whole three weeks following the disaster: this was the second humanitarian catastrophe (after the December 2004 tsunami) that received the most emergency financial assistance among all the natural disasters under investigation. The victims of cyclone Nargis received US$ 9,861,933 in emergency financial assistance in one single day and a total of US$ US$ 22,227,252 in emergency financial assistance over the three weeks following the landfall of the cyclone on Myanmar. This was the case despite the questionable handling of the emergency on behalf of the Burmese military junta and the diplomatic constraints that donor countries had to deal with. These constraints might nevertheless have significantly accounted for the relative slow response in the disbursement of emergency humanitarian assistance.

According to OCHA's Financial Tracking System, the seven donor countries under investigation provided emergency financial assistance to the tune of US$ 15,084,589 to the victims of the Sichuan earthquake that shattered China on the 12$^{th}$ of May 2008. The bulk of the assistance came over two specific days when the donor countries provided almost US$ 5,000,000 per day. Another three humanitarian catastrophes under investigation did receive emergency financial assistance but on a significantly more limited scale. The earthquake that struck Java (Indonesia) on the 27$^{th}$ of May 2006 mobilized US$ 2,621,672 in emergency humanitarian assistance from the investigated seven donor countries. The bulk of the assistance came in two specific days to the tune of US$ 1,000,000 per day. Similarly, when hurricane Stan made its landfall on the Central American Atlantic coast, the seven EU donor countries under investigation answered with the provision of US$ 796,480 in emergency financial assistance. Finally, the floods that affected the Mumbai region (India) in July 2005 triggered the disbursement of only US$ 174,577 from the seven donor countries. If the victims of the three natural disasters mentioned above could complain about the neglect displayed towards them by the seven EU member states under investigation, they were still in a better situation than the victims of the floods that affected Bangladesh in June 2004 or the victims of cyclone Sidr that again struck Bangladesh in July 2007. In these two instances, no EU member state among those investigated provided any sort of emergency humanitarian assistance to the victims of the disasters as reported through OCHA's Financial Tracking System.

Figure 4.1.4. Disbursements per donor country over the period of analysis (US$)




*Source: the author and elaborations from the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA).*

Figure 4.1.4 illustrates the variation in the amount of disbursements provided by each donor country under investigation for the whole period of analysis (January 1st 2000 to December 31st 2008) for the ten investigated natural catastrophes.

By looking at the graph, it immediately becomes apparent the exceptional amount of emergency financial assistance provided by all donor countries on the occasion of the December 26th, 2004 tsunami. More specifically, what emerges is the role played by Germany in leading the commitment and disbursement of humanitarian assistance. Indeed, on the occasion of the tsunami, Germany outdid all other donor countries and in two occasions provided donations to the tune of over US$ 23,000,000 and US$ 31,000,000 respectively. On this occasion, France also played a significant role in the provision of emergency financial assistance, both with a one-off donation of approximately US$ 24,000,000 and with a series of multiple donations between US$ 2,000,000 and US$ 6,000,000 throughout the three weeks following the tsunami itself. In line with the size of their economies, the United Kingdom and Italy also provided some very significant amounts of financial assistance. While providing smaller donations throughout the three weeks following the tsunami itself, the United Kingdom provided especially significant assistance on three specific days to the tune of over US$ 9,000,000, US$ 5,000,000 and again US$ 9,000,000. On a more limited scale, Italy distinguished itself with a significant one-off donation to the tune of approximately US$

12,000,000 well into the third week following the onset of the emergency. Again in line with the size of their economies, The Netherlands and Denmark were the smallest donors on the occasion of the tsunami. Denmark's performance should nevertheless be praised in that, although by far the smallest economy among all the investigated donors, it did nevertheless manage to outdo The Netherlands in terms of total amount of aid provided to the victims of the tsunami. Last but not least, the almost complete absence of Spain among the donors (only US$ 100,000 were donated) for the tsunami should be noticed. While this data is indeed surprising, it should be kept in mind that this study only takes into consideration disbursements recorded through OCHA's Financial Tracking System and that, therefore, donations in kind as the ones that came from the Spanish government (who actually mobilised the navy and other military assets on the occasion of the tsunami in order to provide emergency relief assistance) are not recorded in the graph.

The data for what concerns the provision of emergency humanitarian assistance to the victims of the January 26th 2001 Gujarat earthquake is unreliable to say the very least. It is highly unlikely for the disbursements from all donor countries for this natural disaster to have taken place on the same day. Rather and as pointed out before, the timing of the provision of aid as shown in the graph is likely to be distorted due to administrative and reporting requirements. The 31st of January 2001 is likely to be an arbitrary date set by either by OCHA through its Financial Tracking System or by the national governments themselves. While the timing of the disbursements is unreliable, the quantity is not: on the occasion of the Gujarat earthquake, it was the British and German governments and, to a much more limited extent the Dutch and the Danish ones, that stood out in terms of amounts of emergency assistance provided. The British and the German government provided approximately US$ 10,000,000 and US$ 7,500,000 in aid respectively while the Dutch and Danish governments provided approximately US$ 3,000,000 and 2,500,000 respectively, leaving all other potential donor countries far behind in terms of financial commitments.

Moving on to cyclone Nargis that made its landfall on the shores of Myanmar on the 2nd of May 2008, it can be easily seen how the United Kingdom is the donor that stood out in terms of the amount of humanitarian aid provided with a disbursement of approximately US$ 10,000,000. On this occasion, Denmark and Italy came a distant second and third with disbursements of over US$ 5,000,000 and approximately US$ 4,000,000 respectively. Interestingly ad with the exception of two almost symbolic disbursements from Spain immediately after the landfall of the cyclone, all disbursements that took place in favour of

the victims of cyclone Nargis are to be recorded at least two weeks into the emergency, perhaps highlighting the concern that a number of donors had that the assistance provided would have been mismanaged or siphoned off to the private bank accounts of the ruling military junta.

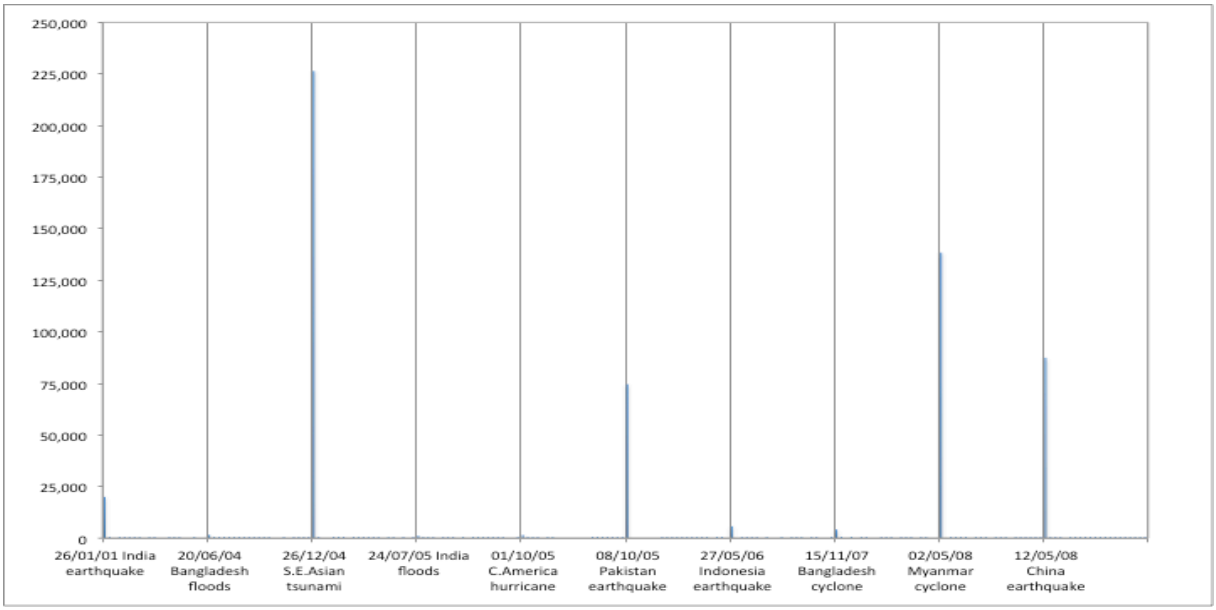
Unlike in the case of cyclone Nargis, the disbursements that took place following the Sichuan earthquake (China) on the 12th of May 2008 were more limited in terms of amounts provided but more constant over time. Indeed, all the donor countries under investigation bar The Netherlands and Denmark provided emergency aid to the tune of between US$ 500,000 and US$ 2,500,000 over the two weeks following the quake itself. It might be no coincidence that the two countries that overall score best in terms of the percentage of GDP dedicated to financial emergency assistance did not contribute any financial assistance to the one recipient country that is by far the wealthiest of all those included in the sample.

Two more natural disasters to have received substantial emergency assistance as recorded through the United Nation's Financial Tracking System are the earthquake in Pakistan-administered Kashmir on the 8th of October 2005 and the Java earthquake of the 27th of may 2006. The victims of the October 2005 Kashmir earthquake received substantial assistance from both the German and the British government. The first provided two instalments of approximately US$ 5,000,000 each while the latter provided two instalments between US$ 5,500,000 and 6,000,000 each. On a much more limited scale, all other donor countries contributed emergency assistance throughout the three weeks following the quake itself, but always remained far from the quantities of assistance provided by Germany and the United Kingdom. The victims of the Java earthquake were to receive significantly less financial assistance than their Pakistani counterparts. The assistance provided was indeed to come primarily through two instalments from the British government, each to the value of approximately US$ 1,000,000 and from a tiny and rather symbolic disbursement of the Italian government.

Finally and on a very negative note, it should be observed that hurricane Stan in October 2005 and the floods that affected western India in July 2005 saw the mobilization of little more than symbolic amounts of emergency financial assistance from a limited amount of donor countries. While the victims of hurricane Stan and the western Indian floods of July 2005 received very limited assistance, these were still able to count on more international support than the victims of other natural disasters. Indeed, the graph above clearly illustrates how the victims of the Bangladesh floods of June 2004 and those of cyclone Sidr in November 2007

could count on no emergency financial assistance whatsoever from any of the seven EU member states under investigation. The international community effectively left the victims of these two humanitarian catastrophes to their own means.

Figure 4.1.5. Total recorded fatalities for the period of analysis



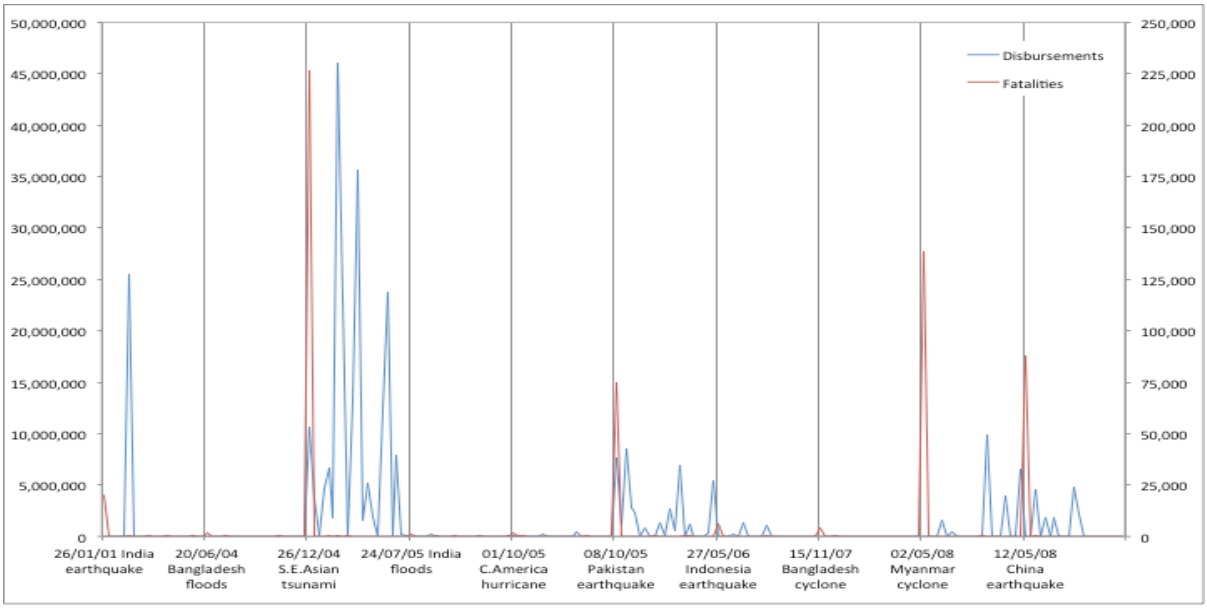

*Source: the author on elaborations from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL).*

Figure 4.1.5 briefly presents in a comparative manner the number of fatalities recorded for each one of the ten natural disasters under investigation within the period of analysis running from the 1st of January 2000 to the 31st of December 2008.

As it immediately becomes apparent, the tsunami of the 26th of December 2004 is the humanitarian catastrophe that recorded by far the highest number of fatalities. Just on the onset of the disaster, over 226,000 people lost their lives. A distant second in this unfortunate ranking, the cyclone that struck Myanmar on the 2nd of May 2008 recorded a still dramatic toll of over 138,000 lives. Next in third and fourth positions, the earthquake that struck the Chinese province of Sichuan on the 12th of May 2008 and the one that struck Pakistani-controlled Kashmir on the 8th of October 2005 caused over 87,000 and 74,000 victims respectively. In a distant fifth place, the earthquake that hit the Indian region of Gujarat on the 26th of January 2001 recorded just over 20,000 fatalities. On a still relatively more limited scale, the earthquake that struck the Indonesian island of Java on the 27th of May 2006 and the cyclone that shattered Bangladesh on the 15th of November 2007 caused almost 6,000 and just

above 4,000 fatalities each. Last but certainly not least, three more natural disasters recorded fatalities in the range of between 1,000 and 2,000 people. These were the Bangladesh floods of the 20th of June 2004, hurricane Stan on much of Central America on the 1st of October 2005 and the Indian floods of the 24th of July 2005.

Figure 4.1.6. Total fatalities against total disbursements for all countries combined




*Source: the author with elaborations on data from the International Disasters Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL) and with elaborations from the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA).*

Figure 4.1.6 simultaneously presents the data for both the number of fatalities recorded and for the total disbursements from all donor countries combined for each of the ten natural disasters under investigation throughout the whole period of analysis (January 1st, 2000 to December 31st, 2008).

By looking at the graph, it appears that, in general, a higher number of recorded fatalities seem to be followed by higher disbursements of emergency humanitarian aid. The results presented by figure 4.1.6 seem therefore to suggest that the amount of humanitarian assistance disbursed following each natural disaster is dependent on the magnitude of the disaster itself (in this case, understood as the total number of fatalities recorded). Furthermore, an explanation that would see changes in disbursements of humanitarian assistance to be dependent upon the total number of fatalities recorded for each natural disaster would be

entirely compatible with the results obtained through the Multiple Regression Analysis (MRA) presented at the beginning of the chapter in figure 4.1.1.

An individual analysis of each natural disaster under investigation further highlights the strong relationship between the number of fatalities recorded and humanitarian disbursements that emerges through the multiple regression analysis given in figure 4.1.1. Outstanding among all the catastrophes examined, the tsunami of the 26th of December 2004 saw the survivors of its over 260,000 fatalities be awarded unprecedented amounts of emergency humanitarian assistance by the international community. Indeed, throughout the three weeks following the onset of the disaster, disbursements of humanitarian assistance kept pouring into the affected countries and recorded peaks of over US$ 45,000,000, US$ 35,000,000 and US$ 24,000,000 per day. Amounts, those recorded, unprecedented in history as unprecedented in history had been the total number of people that had lost their lives in a single humanitarian catastrophe.

On a much more limited yet still significant scale, three other catastrophes saw very high numbers of fatalities being followed by significant disbursements of emergency humanitarian aid. The survivors of the earthquake that struck Pakistani-controlled Kashmir on the 8th of October 2005, those of the cyclone that hit Myanmar on the 2nd of May 2008 and those of the earthquake that shattered the Chinese province of Sichuan on the 12th of May 2008, all could theoretically benefit from significant amounts of assistance from the seven donor countries under investigation. While this was the case also for those who survived the over 20,000 victims of the Gujarat earthquake of the 26th of January 2001, the data provided by the Financial Tracking System of the United Nations' Office for the Coordination of Humanitarian Affairs make it impossible to establish the timing of the disbursements. Last and unfortunately least, the survivors of the remaining five natural disasters under investigation received very limited amounts of emergency financial assistance from the international community. Indeed, the Bangladesh floods of the 20th of June 2004, the Indian floods of the 24th of July 2005, hurricane Stan on Central America on the 1st of October 2005, the earthquake on the Indonesian island of Java of the 27th of May 2006 and the cyclone that struck Bangladesh on the 15th of November 2007, all saw relatively low number of fatalities and, consequentially, very limited disbursements of humanitarian assistance.

### 4.1.2. Summary of the major findings for all countries combined

The quantitative analysis carried out through multiple regression for all donor countries combined provides a variety of interesting results and, most importantly, clearly confirm the research hypothesis according to which the magnitude of a natural disaster under investigation is by far the most significant factor accounting for variation in the disbursement of emergency humanitarian assistance on behalf of the analysed donor countries.

More specifically for what pertains to the point mentioned above, two out of four independent variables investigated to test this particular research hypothesis consistently seem to influence the dependent variable. Indeed, the number of fatalities recorded for a specific natural disaster as well as the number of days that have elapsed since the onset of the humanitarian emergency can account for variation in disbursements of emergency humanitarian assistance provided by the donor countries under investigation. The independent variable accounting for the number of people affected by a selected natural disaster and the one concerning the estimated damages caused by a humanitarian disaster, however, do not seem to be significant in relation to the dependent variable.

When investigating the hypothesis according to which a donor country's domestic politics might play a significant role in influencing disbursements of emergency humanitarian assistance, three out of four of the analysed independent variables (the extent of media coverage of the natural disaster under investigation in a selected donor country, whether or not this finds itself in the midst of an electoral period and whether or not this is led by a centre-left government) do not account for variation in disbursements of emergency humanitarian assistance. Having said that, the evidence on whether or not changes in a country's gross domestic product might influence the dependent variable is more patchy and inconclusive at best. Indeed, that is the case because, despite this independent variable being highlighted as significant by the multiple regression analysis, a more thorough investigation of the variable and a range of considerations previously highlighted in this chapter cast doubts on the extent to which the results for such an independent variable can be seen as entirely reliable.

Aside from the focus on the two research hypotheses presented above, the quantitative analysis carried out for all donor countries contributes to shine some light on important patterns underlying the provision of emergency humanitarian assistance on behalf of European donor governments to countries struck by sudden natural disasters. Chief among

these is the overall performance and commitment of a selected donor country to the provision of humanitarian assistance to the countries struck by the ten natural disasters under investigation. Indeed, while in absolute terms the United Kingdom is the country that provides the most emergency humanitarian assistance following the onset of the ten natural disasters under investigation, it is the Netherlands and, even more so, Denmark that, as a proportion of their economies, are most generous in providing assistance following the onset of a natural disaster. Conversely and still when measured relative to the size of their economies, Spain and particularly Italy are the two donor countries that score the worst performances in terms of their provision of emergency humanitarian assistance to countries struck by a sudden humanitarian catastrophe.

Within the context summarized above, the combined quantitative and qualitative analysis of the relationship between disbursements of emergency humanitarian assistance and a variety of independent variables that is presented below for each individual donor country, aims to investigate in more detail the three research hypotheses according to which the provision of emergency humanitarian assistance might be dependent on the magnitude of a natural disaster, on the domestic politics of the donor country in question or on the *modus operandi* of the humanitarian agency of a selected donor country.

### 4.2. United Kingdom

This second part of the chapter dedicated to data analysis concentrates on the empirical results obtained for the United Kingdom. This part of the chapter is therefore divided into three sections: a first one centering on the quantitative analysis of the "domestic politics" and "disaster magnitude" hypotheses, a second one focussing on the qualitative investigation of the "humanitarian mechanism" hypothesis and a third one providing a brief summary of the major findings.

### 4.2.1. Data analysis for the "domestic politics" and "disaster magnitude" hypotheses

Figure 4.2.1.1. Multiple regression analysis for all the independent variables

Number of observations=210
Time periods=10

| log_disburse | Coef. | Std. Err. | P>\|z\| |
|---|---|---|---|
| gdpus | -0.432 | 0.417 | 0.300 |
| catastroph~y | -0.065 | 0.064 | 0.311 |
| clgovernment | (omitted) | | |
| election | (omitted) | | |
| fatalities | 0.264 | 0.092 | 0.004* |
| affected | -0.051 | 0.072 | 0.473 |
| damage | -0.006 | 0.083 | 0.947 |
| totarticles | 0.200 | 0.153 | 0.191 |
| _cons | 0.371 | 0.294 | 0.206 |

*Key:*

*log_disburse: Logarithmic disbursement (dependent variable)*

*gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation*

*catastroph˜y: Catastrophe day (days elapsed since the onset of a selected natural disaster)*

*clgovernment: Centre-left government (presence or not of centre-left parties in government)*

*election: Election (presence or not of electoral period in the donor country)*

*fatalities: Fatalities (number of fatalities recorded for natural disaster under investigation)*

*affected: Affected (number of people affected by the natural disaster under investigation)*

*damage: Damage (estimated damages recorded for the natural disaster under investigation)*

*totarticles: Total articles (total articles recorded on the natural disaster under investigation*

*_cons: Constant*

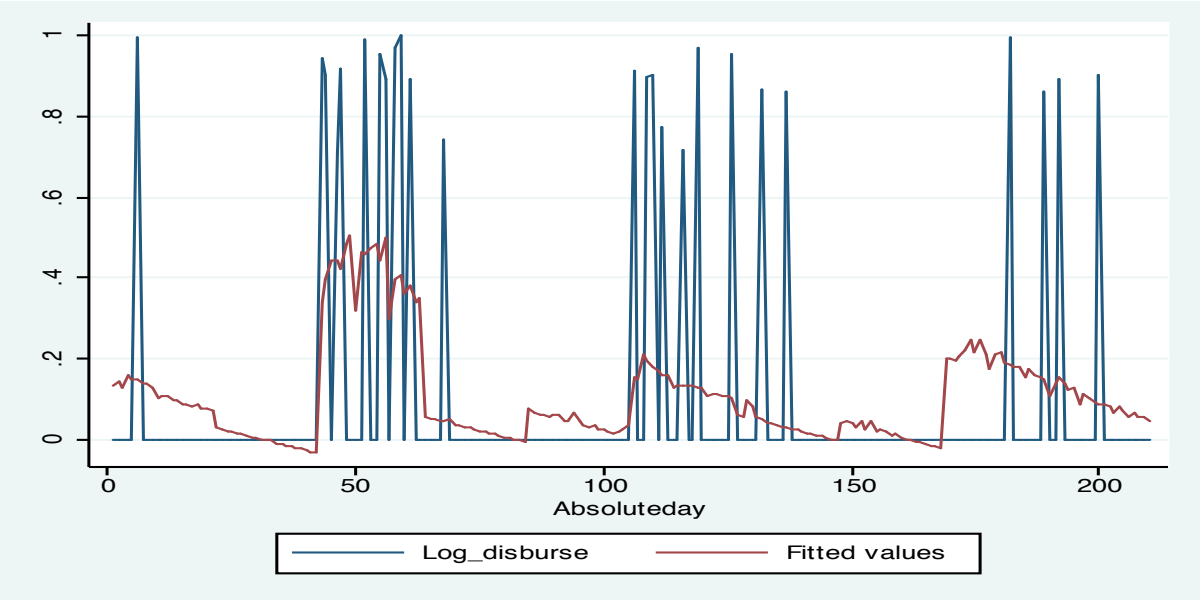
*Source: the author.*

Figure 4.2.1.1 presents the results for the Multiple Regression Analysis (MRA) with Generalised Least Squares (GLS) carried out for the United Kingdom over 210 days of analysis (i.e. the 21 days following the onset of each natural disaster).

A P > z value of 0.004 for the variable pertaining to the number of fatalities recorded highlights the fact that there is an (almost) 100% probability that this investigated independent variable has an effect on the amount of emergency humanitarian assistance disbursed. Conversely, this result suggests that there is an almost 0% likelihood that the obtained value is the result of random distribution. While the P > z value shows the significance of the variable, the absolute value of the coefficient shows its amount of influence. In this case, the independent variables with the coefficients with the highest absolute values are the one for the number of fatalities recorded and the one for the donor country's GDP. Indeed, while the variables for the number of fatalities recorded and for the donor country's GDP both display a very high absolute value for their coefficients (0.264 and -0.432 respectively), only the independent variable for the total number of recorded fatalities shows a significant P > Z value. Within this context, the multiple regression analysis is checked for multicollinearity by computing for the tolerance value by regressing one of the explanatory variables on all other explanatory variables: the diagnostics run for the regression confirm that there is no multicollinearity because there is no VIF in excess of 20 and no 1/VIF below .05. As result of what mentioned above, the most significant independent variable in determining the amount of humanitarian aid disbursed is therefore the total number of fatalities recorded.

To sum up, three key considerations can be made as result of the output provided by the multiple regression analysis for the British case study. To begin with, the number of fatalities recorded for a selected natural disaster is by far the most significant factor influencing the extent to which the British government might be ready to disburse emergency humanitarian assistance. Secondly and in light of this result, the research hypothesis according to which the magnitude of a natural disaster is key in influencing humanitarian aid disbursements to countries struck by a sudden natural disaster can be confirmed. Finally, the evidence suggests that the domestic political dynamics taking place in the United Kingdom the day an investigated natural disaster takes place play absolutely no role in influencing the British government's decision of whether or not to disburse emergency humanitarian assistance to the country struck by the above-mentioned sudden natural disaster.

Figure 4.2.1.2. Comparison of the observed and the predicted values of the disbursements

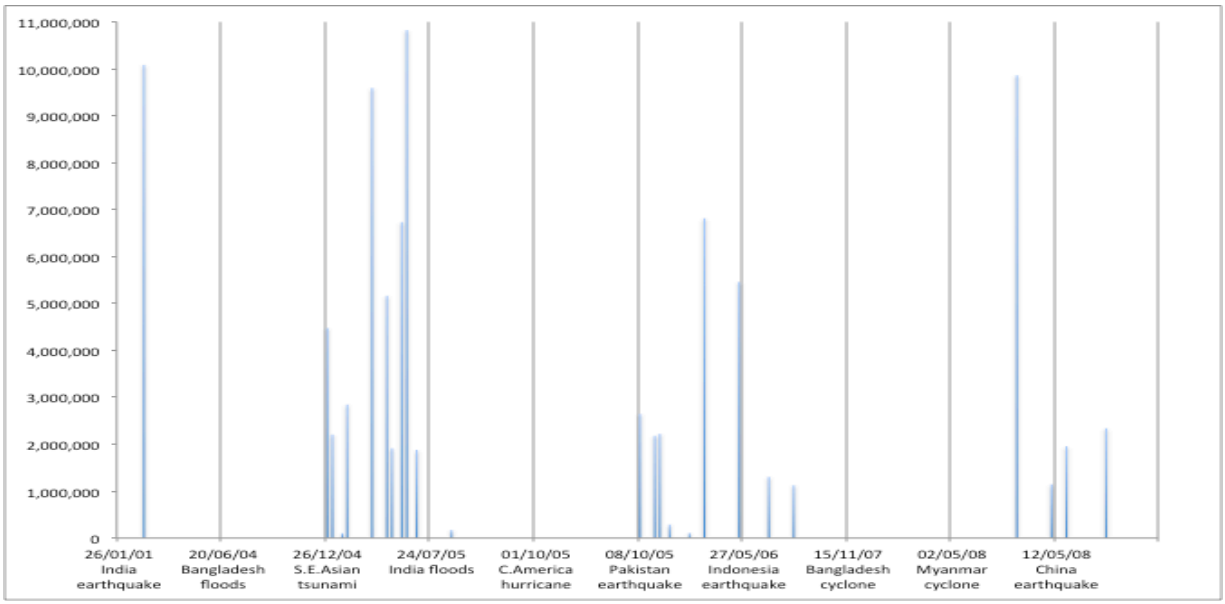



*Source: the author.*

Figure 4.2.1.2 presents the logarithm of the disbursement value and its estimated values for the twenty-one days following the onset of each one of the ten natural disasters analysed throughout the 1st of January 2000 to 31st of December 2008 period.

Having carried out the generalised least squares estimation in figure 4.2.1.6, the corresponding mathematical model is employed in order to estimate the dependent variable. Figure 4.2.1.2 shows the overall performance of the predictive model but also helps to observe its performance for specific stages within the period of analysis. The model seems to predict rather accurately and with a high degree of significance increases in disbursements throughout the period of analysis. Indeed, while the model might at times predict disbursemnts that then fail to take place, it never fails to predict those disbursements that then actually do take place. In particular, the model is particularly accurate in predicting disbursements that take place for the South-East Asian tsunami of the 26th of December 2004 as well as those recorded on the occasion of the earthquake of the 8th of Occtober 2005 in Pakistani-controlled Kashmir.

Figure 4.2.1.3. Disbursements for the 21 days following each natural disaster (US$)




*Source: the author on elaborations from the Financial Tracking System (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA).*

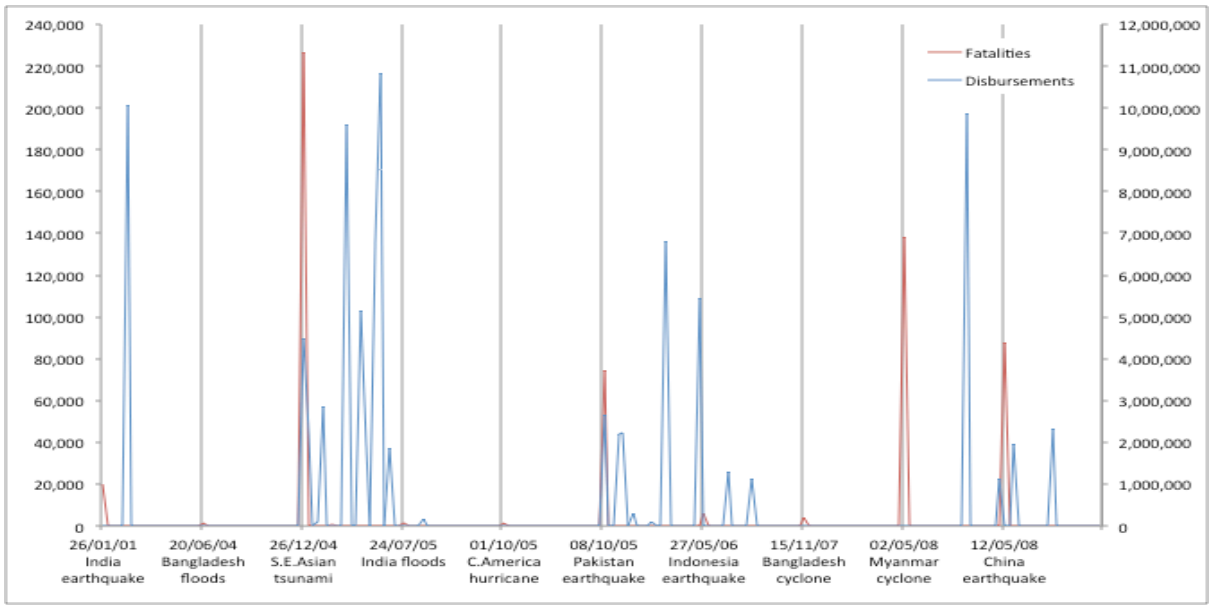
Figure 4.2.1.3 illustrates the disbursements provided by the British government for all the ten selected humanitarian catastrophes within the investigated period of analysis that runs from the 1st of January 2000 to the 31st of December 2008.

In line with the fact that the South East Asian tsunami of the 26th of December 2004 is the natural disaster with the highest number of fatalities recorded among all humanitarian catastrophes investigated, the disbursements recorded for this disaster are also by far the most significant ones. Not only is a single disbursement of almost US$ 11,000,000 the largest single disbursement recorded within our period of analysis, but with six disbursements all ranging between just below US$ 2,000,000 and just below US$ 11,000,000, the total sum of disbursements provided for this humanitarian crises easily dwarfs the financial assistance provided by the British government to any other humanitarian emergency within our period of investigation. While the Gujarat (India) earthquake of January 2001 recorded one very significant disbursement of just above US$ 10,000,000, this data has to be taken with extraordinary caution: the reporting mechanism of the United Nations' Financial Tracking System (FTS) displays a number of inconsistencies in relation to this specific disbursement and therefore one should not take such disbursement at face value in that the data provided might not be accurate.

The other very significant disbursement that can be observed (almost US$ 10,000,000) took place on the 15th of May 2008 in response to the emergency provoked by cyclone Nargis in Myanmar. This disbursement came about a full two weeks following the onset of the humanitarian crises: a development that can most likely be attributed to the fact that the British authorities were reticent to provide any financial assistance unless they could have been sure that this would have been both accepted by the Burmese military junta and then properly used for the benefit of the population and not siphoned off into the private bank accounts of the military regime. Two more significant financial disbursement can be observed within the investigated period of analysis: both made to alleviate the suffering of those struck by the earthquake that hit Pakistan-controlled Kashmir on the 8th of October 2005. These two large payments were preceded by smaller payments hovering between US$ 2,000,000 and US$ 3,000,000 for the same disaster. In this context, there would have appeared to be some sort of moderation in the amounts disbursed combined with a prolonged attention on behalf of the British government.

Financial assistance for the other humanitarian catastrophes under investigation ranged from nil (in the case of the Bangladesh floods of June 2004, the Indian floods of July 2005, the Central American hurricane Stan of October 2005 and cyclone Sidr on Bangladesh in November 2007) to minimal as in the case of the Java (Indonesia) earthquake in May 2006 (two almost consecutive disbursements of just above US$ 1,000,000) or the Sichuan (China) earthquake of May 2008 (two more significant payments both hovering around US$ 2,000,000 at the very end of our period of analysis).

Figure 4.2.1.4. Fatalities and disbursements for the 21 days following each disaster




*Source: Elaborations of the author on data provided by the International Emergency Events Database (EM-DAT) of the Centre for Research of the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL) and the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (OCHA).*

Figure 4.2.1.4 illustrates the relationship between the financial assistance provided by the British government and the number of fatalities recorded throughout the whole period of analysis for the ten natural disasters under investigation.

Looking at graph 4.2.1.4, it immediately becomes apparent how financial disbursements tend to take place following a sudden increase in the recorded number of fatalities due to a natural disaster. Such a trend, once more, confirms the results produced through the multiple regression analysis and it highlights how the magnitude of a disaster (as measured by the number of fatalities recorded) is the driving force behind disbursements of British humanitarian assistance. Although this data in itself should not come as a surprise, a number of more detailed observations are in order.

To begin with, it is interesting to observe that, on the one hand, following certain natural disasters (the South East Asian tsunami in December 2004, the earthquake in Pakistani-controlled territories and the Gujarat earthquake of January 2001) financial assistance to catastrophe-stricken countries is provided almost immediately. On the other hand, in the case of other natural disasters (cyclone Nargis or the Sichuan earthquake), emergency financial assistance took a significantly longer amount of time to be disbursed. Another pattern that can

be observed consists in the fact that, following a peak in the number of fatalities, one or more relatively limited financial disbursements might well precede a later much more significant disbursement: a pattern, this one, that can be easily observed both in the case of the the South East Asian tsunami and the Pakistan earthquake.

Such patterns might be partly explained by the British government's willingness to first assess the actual extent of a catastrophe before committing substantial financial resources to it. Still, such an explanation would not account for the fact that, while following certain natural disasters, emergency financial assistance seems to be made available immediately while in other instances that seems not to be the case. A further explanation for these patterns could therefore be found in fears that the financial assistance might be mismanaged for private purposes by corrupted political leadership (as it might well have been in the case of cyclone Nargis when it struck Burma). Ensuring that substantial financial disbursements are preceded by smaller and targeted disbursements might therefore provide a government with the opportunity to verify the management of the financial assistance received by the affected country and its leadership. These differing patterns mentioned-above are very different to the pattern observed in the previous graph, where an increase in issue salience always took place immediately following a peak in the number of fatalities.

### 4.2.2. Data analysis for the "humanitarian mechanism" hypothesis

While the previous chapter quantitatively dealt with the first two hypotheses under investigation, this chapter investigates the "humanitarian mechanism" explanation by qualitatively exploring the four independent variables selected for it.

1. Internationalisation

The United Kingdom clearly plays a leading role within the international humanitarian community. London has a long tradition of substantial engagement in the field of both development and humanitarian assistance and it is making considerable efforts to further improve its standing with international stakeholders. A number of facts provide evidence in this respect.

To begin with, the United Kingdom is a founding member of the Organisation for Economic Cooperation and Development's Development Assistance Committee (DAC) since its inception in 1961: a powerful steering body that oversees the provision of development and humanitarian assistance to economically least developed countries on behalf of OECD

members. Secondly and together with another 16 countries, the United Kingdom has been a key promoter of the 2003 Good Humanitarian Donorship initiative: a series of informal fora set up to advance the exchange of best practices within the international donor community (Good Humanitarian Donorship 2011). Thirdly, the United Kingdom is party to the 2005 Paris Declaration on Aid Effectiveness and the 2008 Accra Agenda for Action: two high level international initiatives aimed at drafting a comprehensive list of specific actions that all stakeholders should undertake to improve aid effectiveness. Fourthly, in 2006 Britain's Department For International Development (DFID) not only signed up to but also started publishing data within the framework of the International Aid Transparency Initiative (IATI): a scheme developed in order to promote higher standards of transparency and accountability in the realm of development and humanitarian expenditures. Fifthly, high-level reviews of British humanitarian practice such as the one commissioned to Lord Ashdown in 2011 keep emphasising the value of ever-closer cooperation with the international donor community (HERR 2011). Finally, all this legislative and diplomatic activity has always been developed within a context whereby DFID regularly published white papers (in 1997, 2000, 2006 and 2009) in order to encourage other relevant stakeholders to share in the department's reformist zeal. The number of initiatives mentioned above suggests an implicit awareness on behalf of the British Department For International Development (DFID) of the need for the UK to keep engaging with the international humanitarian community as a key component of its policy-making.

2. Financial commitment

While at first sight the performance of the United Kingdom in terms of financial commitment to the provision of humanitarian and development assistance might seem lacklustre, a more historical perspective highlights significant positive developments in terms of the financial resources that London is increasingly ready to dedicate to this policy area.

Throughout the period of analysis, the United Kingdom dedicated an amount of its Gross National Income (GNI) to the provision of Overseas Development Assistance (ODA) well below the average provided by all the seven donor countries under investigation in this dissertation. Indeed, for the whole period of analysis (January 1st 2000 to December 31st, 2008), the United Kingdom destined an average of only 0.38% of its GNI to the provision of ODA against an average of 0.46% of GNI for all donor countries under investigation combined. While it must be acknowledged that the percentage of GNI dedicated to ODA by

the United Kingdom is below the average for all the donor countries investigated in this dissertation, a number of considerations shall nevertheless be made.

Firstly, the average ODA expenditure as a percentage of GNI obtained for all countries combined is skewed by the outstanding performance recorded by Denmark and, to a lesser extent, the Netherlands. Indeed, each one of these two countries dedicated, throughout the period of analysis, an average of 0.88% and 0.80% of its GNI to the provision of ODA. Secondly and once both Denmark and the Netherlands are excluded from the analysis, the United Kingdom together with France provides significantly higher percentages of its GNI to the provision of ODA than Germany, Spain or Italy throughout all the years investigated for the period of analysis. Finally and despite the non-stellar performance scored against Denmark and the Netherlands, a relatively strong commitment to the provision of both humanitarian and development assistance on behalf of the United Kingdom emerges when one adopts a more historical perspective to analyse British disbursements to less economically developed countries.

Within such a perspective, it must be acknowledged that the British government did over the years make a serious attempt to back its official position in favour of further developing humanitarian and development aid policies with increasingly substantial financial resources. Indeed, while between 1995 and 1999 British Overseas Development Assistance (ODA) hovered around US$ 5 billion, between 2000 and 2002 London increased its ODA to approximately US$ 6 billion before stabilising the resources dedicated to this policy area to around US$ 8 billion in the 2003 to 2005 period. From 2006 to 2009, British ODA experienced a continuous and sustained increase from a total of US$ 9.3 billion in 2006 to a record US$ 13.2 billion in 2009.

The amount of Overseas Development Assistance that the United Kingdom has over the years dedicated specifically to the provision of humanitarian aid as opposed to more long-term development assistance is also significant. Indeed, between 1995 and 1999 British humanitarian aid constantly oscillated between US$ 582 million and US$ 485.2 million per year. From 1999 to 2006 and although with notable variations over the years, the UK's humanitarian aid budget significantly increased from US$ 519.9 million in 1999 to a record of over US$ 1.2 billion in 2006. Finally, the 2007 to 2009 period saw Britain's humanitarian aid stabilising around US$ 1 billion per year. Throughout the 1999 to 2009 period, the UK spent therefore between 9.3% and 13.3% of its total Overseas Development Assistance (ODA) on humanitarian aid. As result of what described above, the United Kingdom stands in second

place in Europe and in third place worldwide behind the United States and the European Commission in terms of the absolute amount of financial resources provided for humanitarian assistance (GHA 2011).

3. Operational independence

The British Department for International Development (DFID) is relatively free of undue political interference. Evidence of DFID's relative operational independence is provided by the presence of specific administrative arrangements, by targeted legislative initiatives, by observing which countries have been selected as recipients of British aid and by the choice of the financing channels used by the United Kingdom in order to provide humanitarian assistance to disaster-stricken countries.

To begin with, the fact that decisions to disburse emergency financial assistance can be taken independently by medium to high-ranking civil servants within DFID as opposed to political figures at the ministerial level makes it less likely for policy-decisions to be taken according to foreign policy considerations as opposed to more strictly humanitarian ones. Indeed, due to the politically sensitive nature of development and humanitarian policy, DFID leadership is split between a political dimension and an operational and technocratic one. On the one hand, DFID's political leadership is comprised by the Secretary of State for International Development (currently Rt. Hon. Andrew Mitchell MP), the Minister of State for International Development and the Parliamentary Under-Secretary of State for International Development. On the other hand, DFID operational leadership is assured by the Permanent Secretary (currently Mr. Mark Lowcock), the Director General for Country Programmes, the Director General for Policy and Global Issues and the Director General for Corporate Performance as well as by two external non-Executive Directors in an advisory role.

Secondly, two separate legislative initiatives have contributed to enhance the transparency and the accountability of DFID's humanitarian and developmental activities. The 2002 International Development Act (HMG 2002) at least theoretically untied development aid from economic and trade interests. This was a first important step to publicly acknowledge that geostrategic interests should not trumpet upon humanitarian and developmental concerns. As a next step, the Reporting and Transparency Act approved by Westminster in 2006 has in time enhanced the parliamentary scrutiny of humanitarian activities. Indeed, British MPs have now the legal right to investigate in detail all expenditures made by DFID in order to fulfil its mandate (HMG 2006). As result of the strengthened role of Parliament in the supervision of

humanitarian affairs, DFID is now more than ever encouraged to display a high degree of responsiveness to "humanitarian instances" as opposed to possible "foreign policy directives" that the executive branch might have felt tempted to emanate.

Thirdly, the fact that the recipients of British humanitarian assistance tend not to change despite the constantly evolving geostrategic and military commitments of the United Kingdom is also relevant. Indeed, such a state of affairs seems to suggest that British humanitarian aid is remarkably "depoliticised" and relatively insulated from the risk of being hijacked to fulfil the British government's foreign policy objectives to the detriment of more explicit humanitarian goals. Within this context, African and Asian countries experiencing protracted humanitarian crises comprise the bulk of recipients of British humanitarian aid. The top five recipients of British humanitarian assistance in 2008 were Sudan with US$ 138 million (14.2% of the total), the Democratic Republic of Congo with US$ 87.7 million (9%), Myanmar with US$ 70.8 million (7.3%), Somalia with US$ 66.5 million (6.9%) and Ethiopia with US$ 62.8 million (6.5%). Interestingly, two countries where the UK has for a long time been heavily involved both politically and militarily such as Afghanistan and Iraq came only sixth and seventh with humanitarian aid commitments for US$ 59.5 million (6.1%) and US$ 59.2 million (6.1%) respectively. The one just described above is a pattern sustained over the years: with the exception of 2008 when Myanmar replaced the Occupied Palestinian Territories in third place, the Sudan, the Democratic Republic of Congo and the Occupied Palestinian Territories were consistently the top three recipients of British humanitarian aid in the 2005 to 2008 period.

Finally, the fact that DFID privileges multilateral organisations above all other kinds of first-tier recipients of humanitarian aid seems to suggest that the British government is not able to trump upon explicitly humanitarian criteria for the framing of DFID's policy decisions. Indeed, if that were to be the case, the provision of humanitarian assistance would far more frequently take place through bilateral channels that can more easily be "influenced" so as to contribute to the advancement of British geostrategic objectives. Evidence of this state of affairs is provided by the fact that the channels through which British humanitarian aid is spent show a significant degree of homogeneity over the years. Approximately 45% of all humanitarian aid is channelled through multilateral organisations, approximately 30% of it is released through the European Commission, approximately 15% is disbursed through NGOs and civil society and the remaining 10% is channelled through the public sector. Indeed, in 2008 alone, the European Commission received US$ 310.8 million in financial contributions

from the British government making it by far the largest first-level recipient of British humanitarian aid while UNDP came only a distant second with US$ 150.6 million. Other UN agencies such as OCHA, WFP, UNHCR, UNICEF as well as the IBRD received US$ 86.2 million, US$ 78.1 million, US$ 52.9 million, US$ 37.3 million and US$ 27.8 million each in humanitarian aid financing. At the bottom of the list, UN-HABITAT, the IOM and the IFRC were the last three top-ten first-level recipient of British humanitarian aid with contributions of US$ 5.8 million, US$ 5.5 million and US$ 2.3 million respectively (GHA 2011).

4. Administrative capacity

The United Kingdom's Department for International Development (DFID) presents a well-established and sophisticated administrative structure that enables it to successfully carry out its mandate. Evidence of such a relatively successful administrative set-up can be detected in a variety of instances.

To begin with, the fact that the United Kingdom can count on an entire department dedicated to the provision of humanitarian assistance is indicative of a state of affairs whereby specific human resources are dedicated to deal with the provision of humanitarian assistance. The Conflict, Humanitarian and Security Department (CHASE) is the section within DFID that is tasked with this activity. CHASE is under the leadership of one of DFID's three Director-Generals. More specifically, the Director General for Country Programmes is in charge of the East and Central Africa division, the West and Southern Africa division, the Security, Humanitarian, Middle East, Caribbean and Overseas territories division, the Asia division and the Western Asia and Stabilisation division and, therefore, also heads the Conflict, Humanitarian and Security Department (DFID 2011).

Secondly and unlike in a number of other European donor countries, the United Kingdom has not fragmented responsibility for its official humanitarian response between a variety of operational agencies but kept it all within the sole responsibility of DFID thus making it easier to provide a coherent humanitarian response following the onset of an emergency. Such an arrangement has been made possible by the fact that each of DFID's three executive Director Generals manages a number of country, policy or thematic divisions that comprise all aspects of both the humanitarian and developmental aid cycles. Aside from the Director General for Country Programmes mentioned above, a second Director General for Policy and Global Issues heads the international finance division, the international relations division, the policy division, the research and evidence division (chaired by the Chief Scientific Advisor) and the

Joint Trade Policy unit. Finally, a third Director General for Corporate Performance heads the finance and corporate performance division, the international audit department, the evaluation department, the human resources division, the communications division and the business solutions division. As result of the fact that all aspects of the policy cycle are managed within the same structure, there exist relatively little room for duplication in terms of those activities that shall contribute to humanitarian efforts.

Thirdly, since 1963 DFID has developed an effective *modus operandi* with its humanitarian partners that enables it to better implement its policies when delivering humanitarian assistance on the field. The key institution in this respect is the Disaster Emergency Committee (DEC). While it was established in 1963, this forum was further strengthened following the set up of the Consortium of British Humanitarian Agencies (CBHA) in 2010 and the subsequent institutionalisation of the relationship between DFID and British NGOs. There exists now a clear institutional setting where DFID can exchange views and coordinate its policies with other relevant British humanitarian stakeholders and, therefore, enhance the quality of its humanitarian aid provision.

Finally and unlike some of its European peers, DFID is endowed with some very substantial financial resources that allow it to be a major player within the international humanitarian community. Indeed, with a yearly budget of over GBP 6.7 billion in 2010 alone (HM Treasury 2011), the United Kingdom is the third largest donor of humanitarian assistance worldwide and can play a key role within the international humanitarian system thanks to the smooth operation of DFID's humanitarian and developmental mechanism (GHA 2011).

### 4.2.3. Summary of the major findings for the United Kingdom

When providing a summary of the major findings obtained for the United Kingdom, a number of observations can be made that place the country squarely in the camp of those case studies that most clearly reflect the results obtained by the multivariate analysis for all donor countries combined.

Most importantly and to begin with, the number of fatalities recorded following the onset of a natural disaster is clearly the most significant factor in accounting for the eventual disbursement of emergency humanitarian assistance on behalf of the British government. This finding is corroborated both by the results observed through bivariate analysis as well as, most importantly, by the results recorded through the multiple regression analysis.

Secondly and while the number of recorded fatalities for a natural disaster under investigation seems to be fundamental in influencing the amount of emergency humanitarian assistance provided by Britain to countries affected by a natural disaster, other indicators pertaining to the magnitude of a recorded natural disasters do not seem particularly relevant. Indeed, the number of affected people, the estimated damages recorded and the number of days that have elapsed since the onset of a natural disaster do not significantly influence the extent to which DFID is ready to release emergency humanitarian assistance.

Thirdly, it is important to observe that, in line with the results obtained in the multiple regression analysis performed for all donor countries combined, the hypothesis revolving around the value of domestic politics can be discarded. Indeed, none of the four variables under investigation for this hypothesis (the donor country's GDP, whether or not the United Kingdom finds itself in the midst of an electoral period, the amount of media coverage received by the natural disaster under investigation or whether or not a centre-left party might be in government in the United Kingdom) is able to account for variation in the disbursement of emergency humanitarian aid.

Finally, at least three out of four of the indicators analysed in order to investigate the hypothesis pertaining to the donor country's humanitarian mechanism, can influence the extent to which the United Kingdom provides emergency humanitarian assistance to countries affected by a sudden natural disaster. Indeed, this is the case for the variable accounting for the outstanding extent to which the United Kingdom is involved with the international humanitarian community, the degree to which DFID can be free from undue political influence from the British government when taking policy decisions and the quality of DFID administrative structure and human resources.

### 4.3. Italy

This third part of the chapter dedicated to data analysis focuses on the empirical results obtained for Italy. This part of the chapter is also divided into three sections: one concentrating on the quantitative analysis of the "domestic politics" and "disaster magnitude" hypotheses, another one focussing on the qualitative investigation of the "humanitarian mechanism" hypothesis and a third one providing a summary of the major findings.

### 4.3.1. Data analysis for the "domestic politics" and "disaster magnitude" hypotheses

Figure 4.3.1.1. Multiple regression analysis for all the independent variables

Number of observations=210
Time periods=10

| log_disburse | Coef. | Std. Err. | P>\|z\| |
|---|---|---|---|
| gdpus | -0.355 | 0.754 | 0.638 |
| catastroph~y | -0.070 | 0.050 | 0.163 |
| clgovernment | -0.037 | 0.044 | 0.406 |
| election | -0.064 | 0.149 | 0.671 |
| fatalities | 0.100 | 0.068 | 0.139 |
| affected | -0.094 | 0.060 | 0.121 |
| damage | 0.060 | 0.073 | 0.408 |
| totarticles | -0.224 | 0.119 | 0.060 |
| _cons | 0.346 | 0.483 | 0.473 |

*Key:*

*log_disburse: Logarithmic disbursement (dependent variable)*

*gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation*

*catastroph˜y: Catastrophe day (days elapsed since the onset of a selected natural disaster)*

*clgovernment: Centre-left government (presence or not of centre-left parties in government)*

*election: Election (presence or not of electoral period in the donor country)*

*fatalities: Fatalities (number of fatalities recorded for natural disaster under investigation)*

*affected: Affected (number of people affected by the natural disaster under investigation)*

*damage: Damage (estimated damages recorded for the natural disaster under investigation)*

*totarticles: Total articles (total articles recorded on the natural disaster under investigation*

*_cons: Constant*

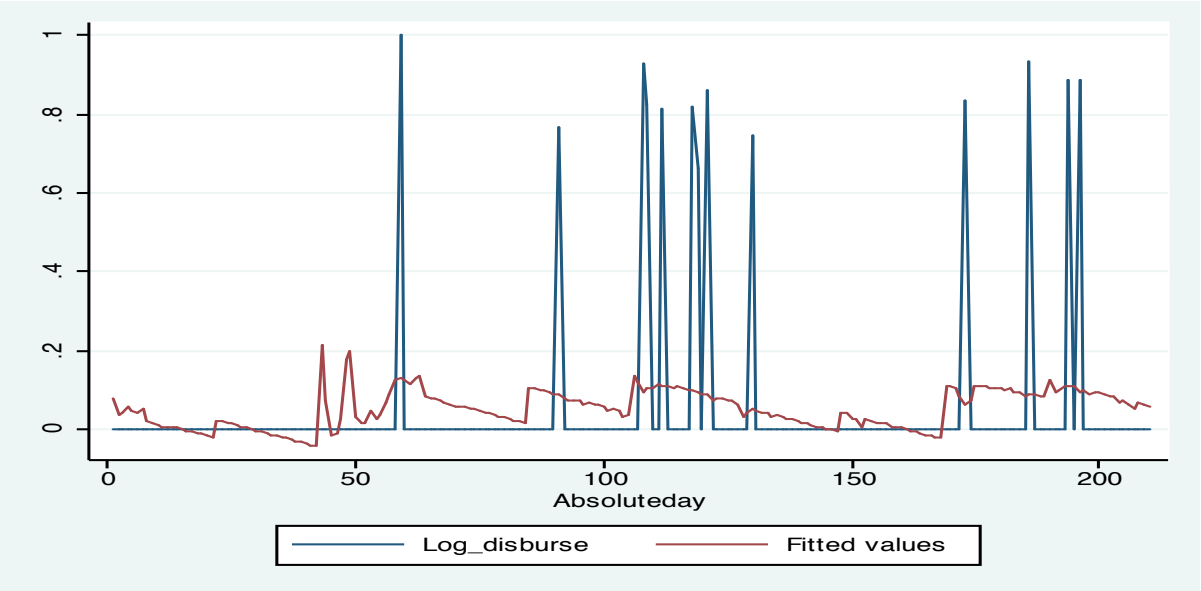
*Source: the author.*

Figure 4.3.1.1 presents the results for the Multiple Regression Analysis (MRA) with Generalised Least Squares (GLS) carried out for the Italy for the period of analysis running from the 1st of January 2000 to the 31st of December 2008.

While a P value of 0.050 or less is generally accepted as a good enough value to discard the null hypothesis that there is no relationship between the dependent and the independent variables under investigation, in the case of Italy there are no values that approach a P > z value of 0.050 or less. One is therefore limited to observe the coefficients of the independent variables in order to estimate the amount of influence that these can have on the dependent variable. In this case, the independent variables with the coefficients with the highest absolute values are those relating to the total number of articles published and to the donor country's GDP (with absolute values of -0.224 and -0.355 respectively). However, this is irrelevant given the non-significance of these (or any other) independent variables (P > z 0.060 and 0.638 respectively). The multiple regression analysis is checked for eventual multicollinearity problems between the independent variables by computing for the tolerance value by regressing one of the explanatory variables on all other explanatory variables. The diagnostics carried out suggest that there is no collinearity between the independent variables: indeed no VIF in excess of 20 or 1/VIF below .05 are recorded.

In light of the output presented above, three considerations can be made. To begin with, no clear results can be obtained for Italy through the multiple regression analysis. Indeed, no single variable seems to be able to account for variation in the level of disbursements of humanitarian assistance. Secondly and unlike as in the other case studies, the fact that the multiple regression analysis is unable to provide any meaningful inferences for the Italian case study suggests that the reasons for variation in the amounts of emergency humanitarian assistance provided to countries struck by a sudden natural disaster are to be found in other explanatory variables not taken into account by the multiple regression analysis. Finally, it can be assumed that a more thorough study of the Italian humanitarian mechanism and the *modus operandi* of its humanitarian agency could provide clues on which alternative independent variables could be included so as to obtain more meaningful results.

Figure 4.3.1.2. Comparison of the observed and the predicted values of the disbursements

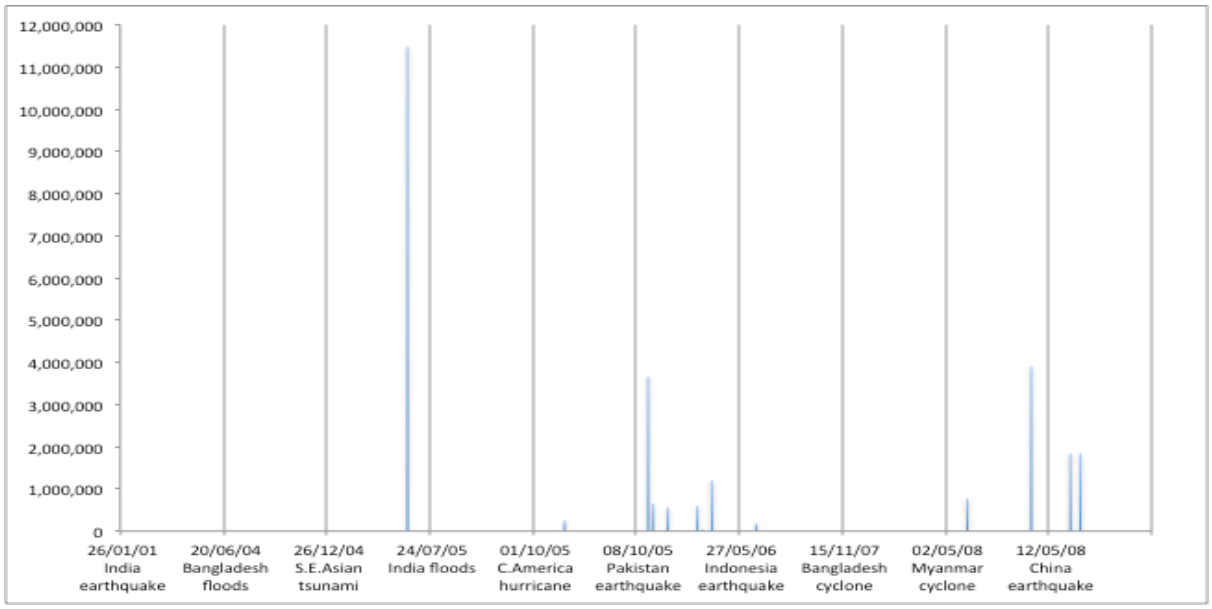



*Source: the author.*

Figure 4.3.1.2 shows the logarithm of the disbursement value and its estimated values for each of the twenty-one days following the onset of each one of the ten natural disasters under investigation.

Once the multiple regression analysis is carried out, the corresponding mathematical model is employed to estimate the dependent variable. This is done in order to observe the predictive performance of the model in general as well as to be able to investigate the model's performance in relation to specific parts of the period under investigation. Looking at figure 4.3.1.2 as well as at the data table that emerged through the multiple regression analysis, no clear pattern of any sort can be observed for Italy. While both the model developed and the independent variables that have been investigated seem to different extents to successfully predict variations in the dependent variable when applied to other donor countries, in the case of Italy both the model and the independent variables do not seem to be be able to provide any significant results. Indeed, while the model seems to a certain extent to be able to predict the disbursements recorded on the occasion of the earthquake of the 8$^{th}$ October 2005 in Pakistani-controlled Kashmir, it nevertheless fails to adequately predict all other disbursements. These unsatisfactory results are, however, perfectly in line with the challenging output provided by the multiple regression analysis.

Figure 4.3.1.3. Disbursements for the 21 days following each natural disaster (US$)




*Source: the author on elaborations from the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA).*

Figure 4.3.1.3 illustrates the timing and quantity of the disbursements of emergency humanitarian assistance provided by the Italian government to the victims of the ten natural disasters under investigation.

As recorded through OCHA's Financial Tracking System (FTS), Italy provided only one single and significant disbursement of emergency financial assistance to the victims of the December 26th, 2004 south East Asian tsunami. This single donation was in the amount of approximately US$ 11,500,000 and it came about in the second week following the tsunami itself. This was the only donation for this humanitarian emergency as recorded through OCHA's FTS.

A second humanitarian emergency where Italy was remarkably active (if not in terms of total disbursements at least in terms of the frequency of its interventions) is the one related to the Kashmir earthquake of the 8th of October 2005. On this occasion, the Italian government almost immediately provided assistance to the tune of almost US$ 4,000,000 and it activated itself on another three occasions providing a total of an additional US$ 3,500,000.

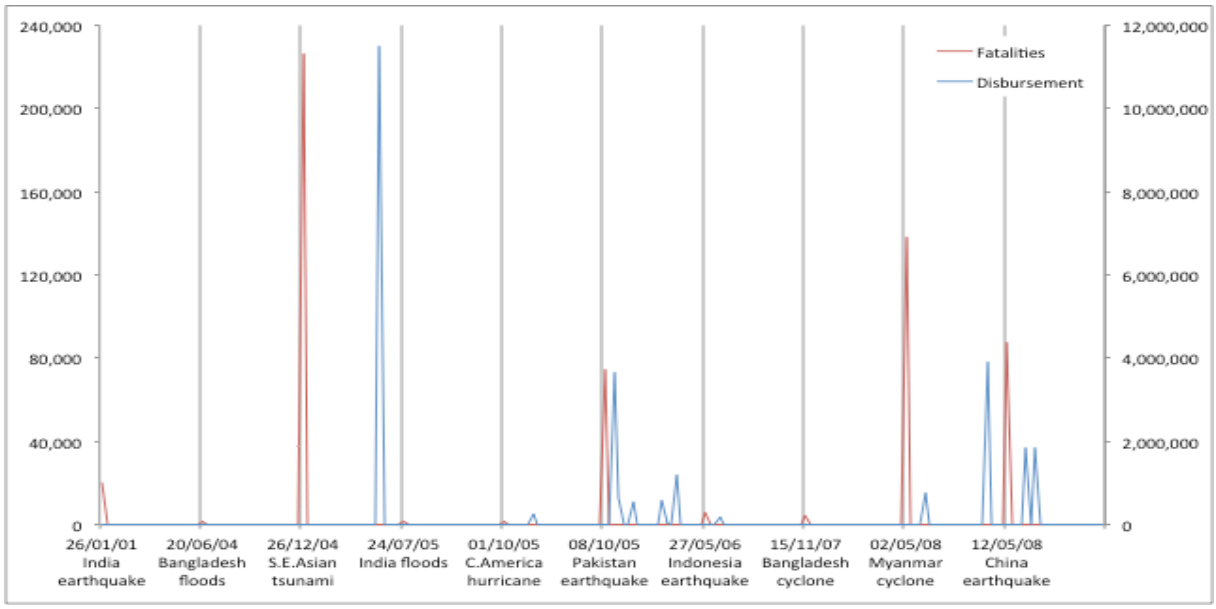
Two more humanitarian crisis that received substantial attention from the Italian government are the ones of cyclone Nargis and the Sichuan earthquake; both in May 2008. Probably due to the peculiar political and diplomatic conditions surrounding the provision of humanitarian

assistance to the government of the Burmese military junta, Italy provided only a symbolic amount of aid to Myanmar immediately following the landfall of cyclone Nargis (less than US$ 1,000,000) and it was only well into the third week following the onset of the crises that more substantial assistance (to the tune of almost US$ 4,000,000) was to come. Things seemed more straightforward on the occasion of the earthquake that struck Sichuan province on the 12th of May 2008. Within the first week following the quake, Italy made two disbursements of almost identical proportion one after the other to provide a total of almost US$ 4,000,000 in humanitarian assistance to the victims of the earthquake.

Finally, the victims of two more humanitarian crises received what amounts to little more than symbolic assistance from the Italian government. On the occasion of hurricane Stan that impacted Central America and on the occasion of the Java earthquake, the Italian government disbursed each time less than a quarter of a million dollars in emergency assistance.

If the victims of the last two mentioned crises could complain of Italian neglect for their plights, they were still to be luckier than the victims of another four humanitarian crises under investigation. Indeed, the victims of the of the Gujarat earthquake of January 26th, 2001, of the floods that affected Bangladesh in June 2004, of the Indian floods of July 2005 and those of cyclone Sidr in November 2011 received no assistance whatsoever from the Italian government as recorded through the United Nations Office for the Coordination of Humanitarian Assistance's Financial Tracking System.

Figure 4.3.1.4. Fatalities and disbursements for the 21 days following each disaster




*Source: Elaborations of the author on data provided by the International Emergency Events Database (EM-DAT) of the Centre for Research of the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL) and the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (OCHA).*

Figure 4.3.1.4 illustrates the relationship between the total number of recorded fatalities for each catastrophe and the disbursements of humanitarian aid provided by the Italian government in response to each natural disaster.

While unsurprisingly there appears to exist some correlation between a higher number of fatalities and greater disbursement of humanitarian aid, more interestingly there also appears to be significant variation in the timing of the provision of aid following a disaster. The South East Asian tsunami of December 26$^{th}$, 2004 is clearly the single humanitarian crises that within our sample both recorded the highest number of fatalities and that received the most assistance from the Italian government. What is particularly interesting to observe on this occasion is the fact that over ten days passed between the onset of the catastrophe and the provision of humanitarian assistance.

A somewhat similar pattern can be observed for what concerns cyclone Nargis on the 2$^{nd}$ of May 2008. Against an exceptionally high number of fatalities (approximately 138,000), after having immediately released less than US$ 1,000,000 immediately after the onset of the disaster, the Italian government waited almost three weeks before providing much more significant assistance to the tune of almost US$ 4,000,000. Indeed, in the case of both of the

two humanitarian disasters that recorded the largest amount of fatalities, the Italian government was extremely slow to respond with the provision of emergency financial assistance. The response of the Italian government was radically different for what concerns the third and fourth largest crises in terms of fatalities recorded. In both the case of the Kashmir earthquake of the 8th of October 2005 (absolute day 106) and the Sichuan earthquake of the 12th of May 2008 (absolute day 190), similar number of fatalities received similar amounts of emergency assistance at similar speeds. In the case of the Kashmir earthquake (approximately 75,000 fatalities), the Italian government provided emergency financial assistance to the tune of almost US$ 4,000,000 immediately after the quake itself and even provided some more limited assistance in the following weeks. In the case of the Sichuan earthquake (approximately 87,000 fatalities), the Italian government again reacted quickly providing to almost identical donations of almost US$ 2,000,000 each within one week from the day of the quake itself. In both these two disasters, the Italian government was therefore quick to react and it provided similar degrees of assistance to the victims. In two more instances and in line with the relatively limited number of fatalities, the amount of humanitarian assistance provided was much more limited. This was the case for hurricane Stan (absolute day 85) and for the Java earthquake (absolute day 127) where less than 2,000 and less than 6,000 fatalities respectively never received more than a quarter of a million dollars in humanitarian assistance.

Unlike in the case of other humanitarian crisis, the victims of four natural disasters under investigation received no assistance whatsoever from the Italian government. While this data is not so surprising for humanitarian crises where the total number of fatalities was relatively low (approximately 1,700 fatalities in the Bangladesh floods of June 2004, 1,250 in the Indian floods of July 2005 and 4,250 because of cyclone Sidr in November 2007), this data is still surprising for what concerns the Gujarat earthquake of January 26th, 2001 (absolute day 1). In this last instance, over 20,000 fatalities were recorded and yet, despite the very high number of victims, no emergency financial assistance was provided by the Italian government to the people affected by the quake.

### 4.3.2. Data analysis for the "humanitarian mechanism" hypothesis

While the previous chapter quantitatively dealt with the first two hypotheses under investigation, this chapter investigates the "humanitarian mechanism" explanation by qualitatively exploring the four independent variables selected for it.

1. Internationalisation

Italian involvement with the international humanitarian community is relatively recent and of a limited nature. Indeed, when compared with its fellow European partners, Italy displays a number of characteristics typical of a country that has only recently began to attempt to develop a coherent humanitarian policy within the international humanitarian community.

First of all and despite its relatively high GDP per capita, the fact that Italy was for many years simply not present within the international humanitarian community with an agency dedicated to the provision of humanitarian assistance is telling of Italy's limited presence on the international humanitarian stage. Indeed, the fact that the Italian Directorate General for Development Cooperation (DGCS) was established only in 1987 (i.e. over two decades later than its equivalents in other European member states) is emblematic of Italy's latecomer status in the field. Secondly, Italy tends to be a follower rather than a leader in setting the agenda of the international humanitarian community. Evidence of this can be traced back to Italy joining the 'Good Humanitarian Donorship Initiative' only in 2007 (four years after this was initially launched) and, in the same year, by the country's adopting the European Consensus on Humanitarian Aid as the basis for its humanitarian aid policy as opposed to developing an independent and more structured national overarching policy framework. Thirdly, Italy was one of the few countries not to be part of the broad coalition that contributed to launch the 2008 International Aid Transparency Initiative (IATI): a policy that might mirror the country's less than stellar performance in terms of accountability and financing reporting. Last but not least, the Humanitarian Response Index 2008 (the latest one available for the period of analysis taken into consideration by this dissertation) presented by Development Assistance Research Associates (DARA) once more highlights how limited international cooperation with other humanitarian partners is one of the greatest weaknesses of the Italian humanitarian system (DARA 2008).

2. Financial commitment

Italy scores particularly poorly in terms of its financial commitment to both humanitarian and development aid policies. Indeed, the country's financial commitment to the provision of humanitarian and development assistance is both very limited in quantity and of questionable nature in terms of its quality.

Italy is by far the worst country among the seven donor countries under investigation when it comes to the percentage of Gross National Income (GNI) dedicated to the provision of

Overseas Development Assistance (ODA). Indeed, with an average of 0.18% of its GNI dedicated to ODA compared to the average of 0.46% reported for all investigated donor countries combined for the whole period of analysis (January 1st 2000 to December 31st, 2008), Italy scores an abysmal performance (UNData 2011). The poor performance in terms of development assistance mentioned above is mirrored by mediocre results posted in terms of the provision of humanitarian assistance. Indeed, with just above 0.0002% of its Gross National Income (GNI) disbursed for the ten natural disasters under investigation in this dissertation, Italy ranks in second-last position among the seven donor countries under investigation (ahead of Spain) in terms of its commitment to the provision of humanitarian assistance.

Italy's poor performance in terms of humanitarian aid provision falls within a broader lack of financial commitment to the provision of long-term development assistance. Indeed, despite having signed up to the pledge to dedicate at least 0.07% of its Gross National Income (GNI) to Overseas Development Assistance (ODA) by the year 2015 at the 2002 Monterrey Conference on Financing for Development, Italy's commitment by the year 2008 was still only a meagre 0.20% of its GNI (OECD 2009). Within such a discouraging context, data analysed in a more historical perspective further reinforce the impression that Italy's financial commitment to humanitarian and development assistance remains very limited throughout the investigated years. Indeed, between the year 2000 and the year 2008, the amount of gross national income that Italy dedicated to overseas development assistance increased from an abysmal 0.13% to only 0.20% of its GNI (OECD 2001, 2009).

Not only does Italy dedicate few financial resources to aid provision but also, when it does so, it provides 'poor quality' assistance. Indeed, when one looks at the breakdown of development assistance provided, a number of issues come to light. Firstly, a significant proportion of what the Italian government counts as development assistance is actually nothing more than debt relief on past credits to developing countries that the Italian government would anyways be almost sure never to see repaid. This debt relief masked as development assistance accounted for €624,090,000 in 2008 alone and it represents a staggering 38.70% of Italian 'development assistance' in that year. Secondly, the Italian government creatively manages to count 'costs for refugees in donor countries' (i.e. in Italy) as expenditure for development assistance. Indeed, this expenditure was €2,110,000 in 2008 alone and it accounts for 0.13% of the total budget. Finally, it shall be pointed out that the Italian government itself highlights the extent to which transparency in reporting government

expenditure is not taken seriously when it manages to have two budget lines literally called 'unspecified' and 'other businesses' for a total of €20,840,000 and €5,090,000 accounting for 1.29% and 0.32% of the total budget respectively.

3. Operational independence

The operations of the Italian Directorate General for Development Cooperation (DGCS) are hampered by the fact that the DGCS is granted a very limited amount of independence vis-à-vis the political establishment. Indeed, a number of indicators highlight a state of affairs whereby DGCS is likely to frequently be the target of undue political pressure.

To begin with and unlike the case in the United Kingdom, in Italy there appears to be no clear-cut separation between DGCS's top political leadership and the highest echelons of its operational structure (DGCS 2008). Indeed, in a context whereby career diplomat Elisabetta Belloni heads the Directorate General with the support of other politically appointed administrators such as the central director for the programming of cooperation interventions, the central director for administration and general affairs and the director for the central technical unit, there appears to be no clear distinction between political and operational leadership. Such a situation inevitably makes it more likely for a state of affairs to emerge whereby humanitarian considerations and broader geopolitical ones come into conflict with one another. The situation mentioned above is not helped by the fact that, in Italy, there is no figure such as a vice-minister or a permanent secretary for development and humanitarian assistance nor a specialised development or humanitarian aid committee within the Italian Parliament that would have an interest to "shield" humanitarian and development aid policies from undue political pressures.

Secondly, in the case of Italy there appears to exist virtually no legal guarantees in terms of the insulation of humanitarian aid policy from the Italian government's foreign policy objectives. Indeed, while law n. 47 of the 26th of February 1987 establishes the framework for the set up and running of the Directorate General for Development Cooperation, no specific legislation aimed at ensuring the independence of Italy's humanitarian agency from undue political interference seems to have been put in place to date (COOPI 2011).

Thirdly, a quick look at the list of the recipients of Italian humanitarian assistance seems to suggest that, as it is the case for longer-term development aid, the choice of where to allocate humanitarian assistance tends to follow geostrategic interests rather than exclusively humanitarian criteria. In this respect, it is unfortunate to observe that the top recipients of

Italian humanitarian assistance also happen to be countries that either have long historical and colonial ties with Italy or countries that see the presence of Italian military involvement on the ground. Indeed, in the last year of analysis for this dissertation, four of the six main recipients of Italian humanitarian aid happened to be Lebanon, Somalia, Afghanistan and Iraq (DARA 2008).

Finally, the choice of channels through which Italy routinely provides its humanitarian and development assistance to economically less developed countries highlights a state of affairs whereby aid could easily and frequently be employed as a foreign policy "lubricant" to serve the country's geostrategic interests. There are four financial channels through which DGCS can carry out its mission. A first channel is represented by the provision of financing through national embassies in the disaster-stricken countries. These are bilateral initiatives with ad-hoc disbursements that are directly administered by the Italian embassy in the relevant country and that tend to address a specific aspect of an unfolding emergency. A second channel of funding is constituted by voluntary financial contributions to the support of international organizations. These are 'revolving funds' (financial commitments re-iterated on an annual basis) that provide financing for the World Food Programme (WFP), the Office for the Coordination of Humanitarian Affairs (OCHA), the Red Cross, the World health organization (WHO), the United nations Development programme (UNDP), the United nations High Commission for Refugee (UNHCR) and the United Nations' Children Fund (UNICEF) and the like. A significant part of this funding goes into the management and support of operations that take place from the United Nations Humanitarian Response Depot in Brindisi: this is the largest depot of its kind worldwide from which emergency relief aid can be dispatched anywhere in the world with a 24 to 48 hours notice (UNHRD 2011). A third funding channel is the self-explanatory 'fund for de-mining operations'. Finally, a fourth type of funding is the one provided to the Italian Agency for the Provision of Agricultural Goods (AGEA) for the collection and delivery of agricultural supplies to famine-stricken countries. While the ones mentioned above are the channels through which Italy could theoretically provide humanitarian assistance, it must be noted that 86.1% of Italian humanitarian aid is actually disbursed through bilateral channels (DARA 2008). Italy therefore still makes widespread use of bilateral funding channels rather than multilateral ones in order to provide humanitarian assistance to disaster-stricken countries. Such a policy makes it more likely for humanitarian assistance to be provided with various kinds of conditionality attached so as to serve not strictly humanitarian purposes but, rather, geostrategic ones.

4. Administrative capacity

Unlike in the case of many of its European peers, Italy lacks a well-established governance structure through which effectively articulate and implement its humanitarian policy. Indeed, a number of factors underline the weak administrative capacity of Italy's Directorate General for Development Cooperation (DGCS) and its relationship with relevant stakeholders.

To begin with, the human resources that Italy dedicates to the management of its humanitarian operations are very limited. Indeed, only a small unit (out of seven offices) under the supervision of the central director for the programming of cooperation interventions is tasked with implementing humanitarian policy for the Italian DGCS (DGCS 2008). In this respect, the provision of humanitarian assistance falls only at the very bottom of an organisational structure made up by the Ministry of Foreign Affairs, the Directorate General for Development Cooperation and, finally, by the central director for the programming of cooperation interventions. While unlike some of its European partners Italy does not necessarily suffer from the fragmentation of its humanitarian agency in a variety of specialised sub-units, the small size of DGCS' humanitarian department certainly limits the administrative burden that the directorate can sustain.

Within this context, The Italian Directorate General for Development Cooperation also seems to have been unable to set up, manage and develop a forum where to exchange best practices and coordinate humanitarian policy with key Italian stakeholders of the sector. While the DGCS lists a variety of NGOs and associations it cooperates with, this interaction seems to take place either bilaterally or on an *ad hoc* basis (DGCS 2008). An institutionalised and permanent forum whereby DGCS takes the lead in involving all relevant humanitarian stakeholders seems therefore not to be in place.

On top of what already mentioned above, the fact that the Italian Directorate General for Development Cooperation (DGCS) can exercise only a limited degree of control over the financial resources it needs to carry out its mandate makes it difficult for DGCS to enhance its administrative capacity. Indeed, when compared to its European peers, DGCS can count on very limited financial resources. Out of a total of €4,860,640,000 spent by the Italian government in development assistance in 2008, only €904,353,158 have been managed and controlled directly by the Directorate General for Development Cooperation (DGCS) while the lion's share of the budget was managed by the Italian Foreign Ministry (DGCS 2008). The financial resources that are left under the direct competence of the Directorate General for

Development Cooperation (DGCS) are therefore a small proportion of the total financial resources dedicated to development and humanitarian assistance administered directly by the Ministry of Foreign Affairs. In the last year under investigation, financing for DGCS was obtained overwhelmingly through the yearly 2008 general financial law as dictated by point C of law 49/87 (€668,997,328), to a much more limited amount through article 15 of law 49/87 (€95,313,676) and through the 2008 budget law (€64,442,144). On top of these regular sources of financing, the DGCS also received additional funds through two ad-hoc special laws designed to finance Italy's participation to international military and humanitarian operations for a total of €75,600,000. The fact that the limited financial resources made available to the DGCS are overwhelming dependent on cash transfers from the foreign ministry and other *ad hoc* disbursements makes it very difficult for DGCS to plan its operations strategically, to clearly asses its long-term financial perspectives and to enhance its administrative capacity.

### 4.3.3. Summary of the major findings for Italy

A summary of the major findings obtained for Italy has to focus, paradoxically, on the absence of meaningful results. Unlike as in the case of the United Kingdom, when exploring the relationship between disbursements of emergency humanitarian assistance and the independent variables under investigation, no clear correlation let alone causal mechanism can be established.

To begin with, neither the multiple regression analysis nor the bivariate analyses conducted for Italy have been able to identify any meaningful correlations between variations in any of the four independent variables employed to explore the hypothesis pertaining to the magnitude of a natural disaster. Unfortunately, that has been the case despite the more interesting results obtained through the multiple regression analysis carried out for all donor countries combined as well as for those run for the other individual case studies.

Furthermore, the same unsatisfactory results were recorded for the four independent variables that were investigated to explore the hypothesis that concentrated on Italy's domestic politics as a key explanatory factor that could have accounted for variation in the disbursement of emergency humanitarian assistance. Again, this was the case despite the fact that, at least for some of the other donor countries under investigation, the multiple regression analyses provided some interesting insights.

Having made the points above, it could possibly be argued that the specific characteristics of the Italian humanitarian mechanism could have a bearing on the apparent impossibility of establishing clear correlations or causal mechanisms between the dependent variable and any of the independent variables under investigation. Indeed, the four independent variables analysed to investigate the "humanitarian mechanism hypothesis" for this donor country do have one feature in common: the significantly poor performance scored by Italy vis-à-vis the vast majority of other donor countries under investigation.

Last but not least and in light of the challenges presented by this case study, it shall be stressed that extensive further research should be carried out in order to account for the patterns of the disbursements (or lack thereof) of humanitarian assistance on behalf of the Italian government. Indeed, further research that were to be carried out in this sense could provide interesting inputs that could prove themselves useful in contributing to decode the country's peculiar *modus operandi* as well as its policy-making in the field of humanitarian assistance.

### 4.4. The Netherlands

The fourth part of the chapter dealing with the data analysis focuses on the results obtained for the Netherlands. This part of the chapter is made up by three sections: one dedicated to the quantitative analysis of the "domestic politics" and "disaster magnitude" hypotheses, a second one which centers on the qualitative investigation of the "humanitarian mechanism" hypothesis and a third one providing a summary of the major findings.

### 4.4.1. Data analysis for the "domestic politics" and "disaster magnitude" hypotheses

Figure 4.4.1.1. Multiple regression analysis for all the independent variables

Number of observations=210
Time periods=10

| log_disburse | Coef. | Std. Err. | P>\|z\| |
|---|---|---|---|
| gdpus | -2.682 | 0.774 | 0.001* |
| catastroph~y | -0.019 | 0.029 | 0.521 |
| clgovernment | -0.036 | 0.039 | 0.344 |
| election | -0.009 | 0.059 | 0.884 |
| fatalities | 0.202 | 0.041 | 0.000* |
| affected | -0.044 | 0.037 | 0.237 |
| damage | 0.040 | 0.045 | 0.379 |
| totarticles | -0.243 | 0.085 | 0.004* |
| _cons | 0.568 | 0.176 | 0.001 |

*Key:*

*log_disburse: Logarithmic disbursement (dependent variable)*

*gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation*

*catastroph˜y: Catastrophe day (days elapsed since the onset of a selected natural disaster)*

*clgovernment: Centre-left government (presence or not of centre-left parties in government)*

*election: Election (presence or not of electoral period in the donor country)*

*fatalities: Fatalities (number of fatalities recorded for natural disaster under investigation)*

*affected: Affected (number of people affected by the natural disaster under investigation)*

*damage: Damage (estimated damages recorded for the natural disaster under investigation)*

*totarticles: Total articles (total articles recorded on the natural disaster under investigation*

*_cons: Constant*

*Source: the author.*

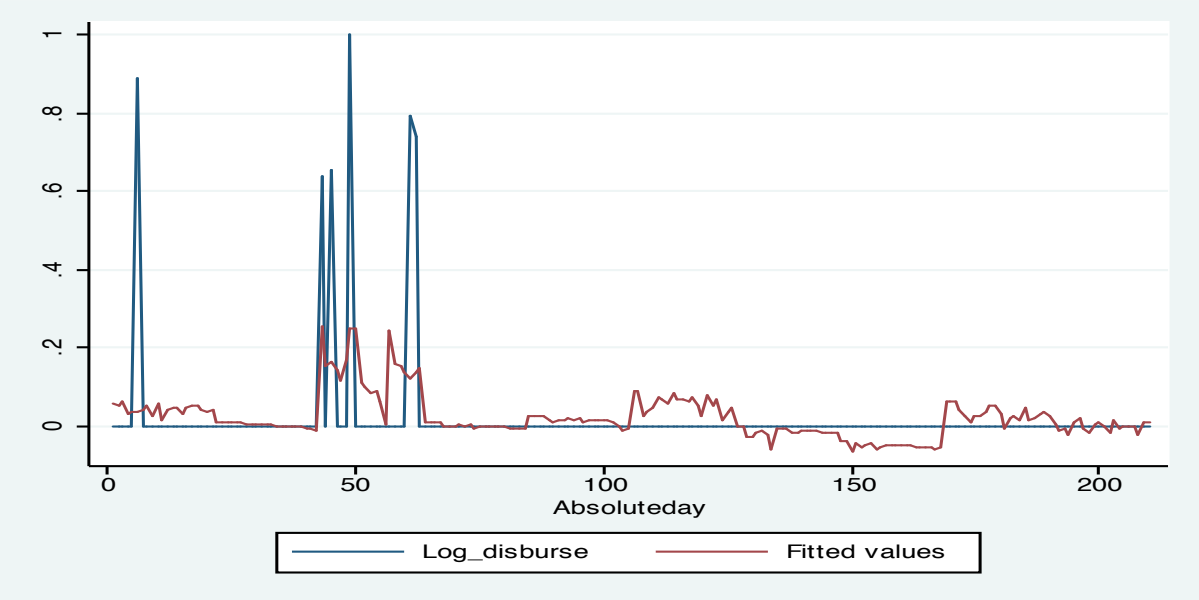
Figure 4.4.1.1 presents the results for the Multiple Regression Analysis (MRA) with Generalised Least Squares (GLS) carried out for the Netherlands for the investigated natural disasters in the 1st of January 2000 to the 31st of December 2008 period of analysis.

Figure 4.4.1.1 presents P > z values of 0.000, 0.001 and 0.004 for the variables represented by the total number of fatalities recorded, the donor country's Gross Domestic Product (GDP) and the total number of published articles respectively. This highlights the fact that in all these instances there is an almost 100% probability that these three investigated independent variables have an effect on the dependent variable represented by disbursements of humanitarian assistance. Furthermore, this means that there is always an almost a 0% likelihood that the obtained value is the result of random distribution. Looking beyond the degree of significance presented by the P > z values, the independent variables with the coefficients with the highest absolute values are those pertaining to the donor country's gross domestic product, to the total number of fatalities recorded and to the total number of published articles. Indeed, these three variables all display both a very high absolute value for their coefficients (-2.682, 0.202 and -0.243 respectively) as well as very significant P > z values of (almost) 0.000. The most significant independent variables in determining the value of the dependent variable represented by the disbursements of humanitarian aid are therefore the total number of fatalities recorded, the country's Gross Domestic Product (GDP) and the total number of articles published on a natural disaster under investigation. Having said that and as it has been the case with the regression run for all donor countries combined, the fact that the gross domestic product variable displays both a negative coefficient and a very high standard error (0.774) should invite caution when assessing the variable itself. After running the regression, specific steps have been taken in order to check for the eventual presence of multicollinearity problems between the independent variables presented in the multiple regression analysis by computing for the tolerance value by regressing one of the explanatory variables on all other explanatory variables. The results obtained through the diagnostics show that no multicollinearity is recorded.

In light of the data presented above, three main considerations can sum up the findings obtained. To begin with, the number of fatalities recorded for the natural disasters under investigation is the factor most likely to influence the extent to which the Dutch government might be ready to provide emergency humanitarian assistance to countries struck by a sudden natural disaster. This finding therefore seems to confirm the hypothesis according to which the magnitude of a natural disaster is a fundamental factor in influencing the extent of the

provision of emergency humanitarian assistance. Secondly and unlikely as it has been the case for other donor countries, the extent of media coverage (i.e. the number of published articles) of the selected natural disasters seems to impact the level of disbursement of humanitarian assistance. Finally and as explained above, both the findings pertaining to the above-mentioned variable and, to an even greater extent, those pertaining to the variable accounting for the country's gross domestic product, should not be taken at face value but, rather, investigated in greater depth.

Figure 4.4.1.2. Comparison of the observed and the predicted values of the disbursements



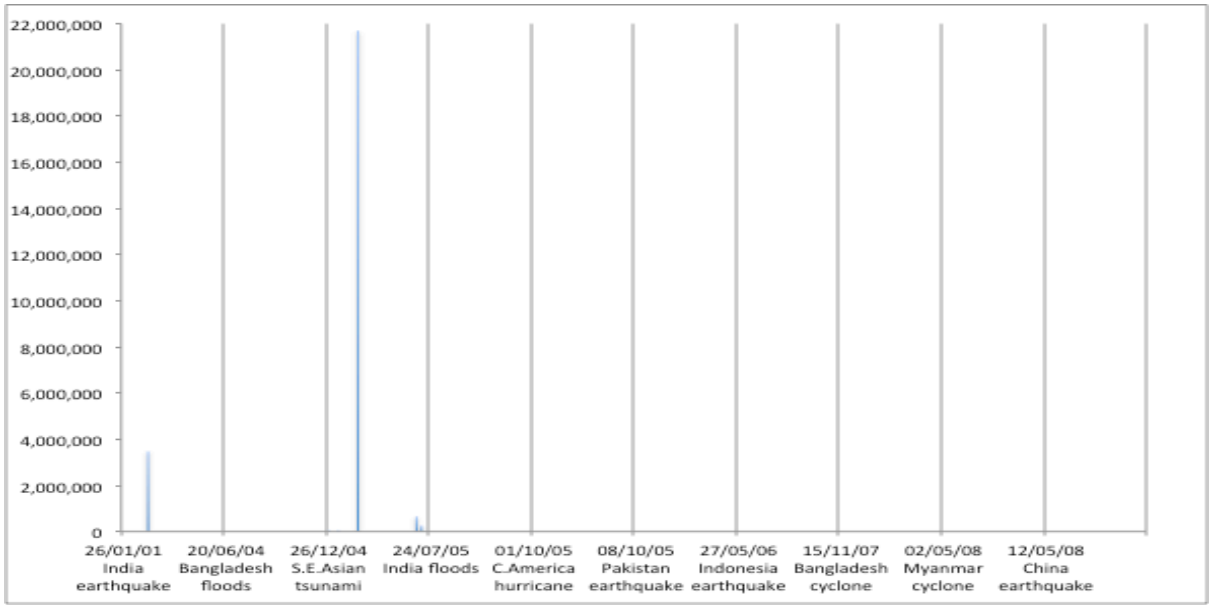

*Source: the author.*

Figure 4.4.1.2 shows the logarithm of the disbursement value and its estimated values for each of the twenty-one days following the onset of each one of the ten natural disasters under investigation.

Following up on the generalised least squares estimation, the corresponding mathematical model is adopted in order to estimate the dependent variable. In figure 4.4.1.2 one can observe the logarithm of the value of the disbursement and the values that have been estimated for the twenty-one days following each of the ten natural disasters selected. Figure 4.4.1.2 shows therefore both the overall performance of the predictive model and its performance for specific stages within the period of analysis. While the independent variables for the first disbursement (corresponding to the Gujarat earthquake of the 26$^{th}$ of January 2001) do not seem to predict the disbursement itself, it should be kept in mind that the data for the timing of this disbursement is not entirely reliable due to possible reporting inaccuracies in OCHA's

Financial Tracking Service (FTS) for the global disbursements that have taken place on the occasion of this specific natural disaster. At the same time, the model and the most significant independent variables predict all the other disbursements made by the Dutch government throughout the period of analysis: namely, those recorded on the occasion of the tsunami that struck South-East Asia on the 26th of December 2004.

Figure 4.4.1.3. Disbursements for the 21 days following each natural disaster (US$)




*Source: the author on elaborations from the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA).*

Figure 4.4.1.3 illustrates the timing and the quantity of disbursements on financial assistance provided by the Dutch government to countries affected by any of the ten humanitarian catastrophes investigated in the January 1st 2000 to December 31st 2008 period of analysis.

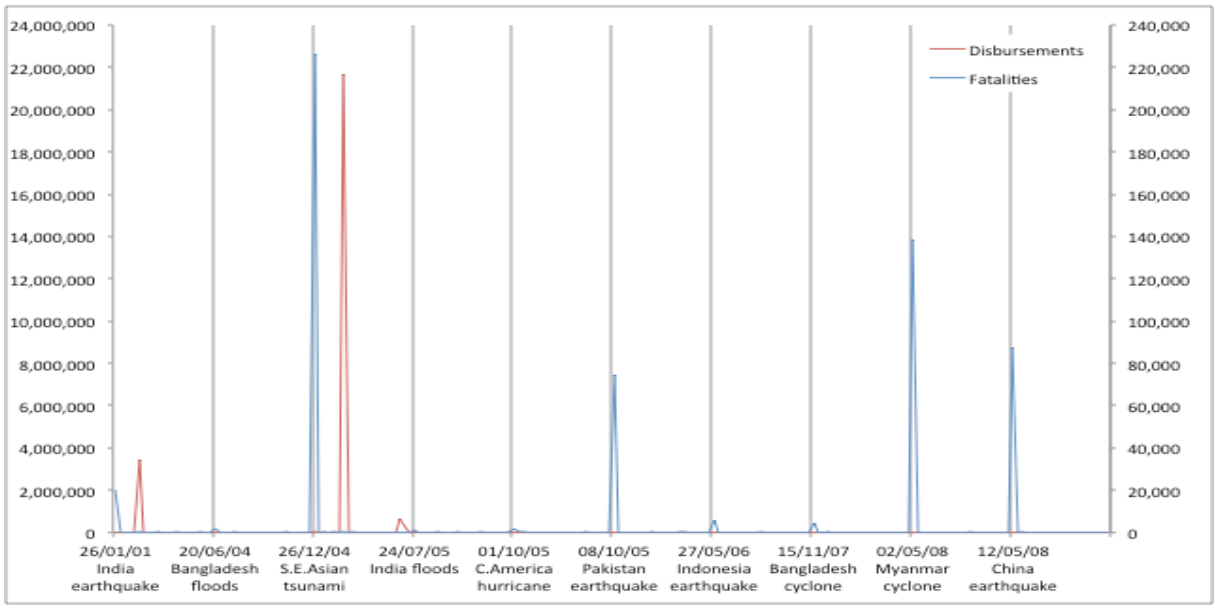
What immediately appears striking by observing the graph is the extremely limited number of times when the Dutch government provided emergency financial assistance over the period of analysis. The Netherlands provided almost US$ 22,000,000 in emergency financial assistance following the December 2004 tsunami that struck most of South East Asia. This was an exceptional disbursement that took place less than one week following the tsunami itself and was in line with the exceptional magnitude of the disaster. Previously and immediately following the tsunami itself, the Dutch government had provided the symbolic amounts of US$ 50,000 on the actual day of the tsunami and an additional US$ 64,035 two days later. Finally for what concerns the December 2004 tsunami, the Dutch government made two

additional disbursements of just above US$ 650,000 and just above US$ 260,000 almost three weeks following the tsunami itself.

The only other humanitarian disaster that received any emergency financial assistance within the nine-year period of analysis is the earthquake that struck Gujarat (India) on January 26th, 2001. Following the quake, the Dutch government provided almost US$ 3,500,000 in emergency financial assistance less than a week after the disaster. As result of these disbursements, the December 2004 tsunami and the January 2001 Gujarat earthquake were the two only humanitarian catastrophes that received any emergency financial assistance from the Dutch government.

While this result might seem at first shocking, it must be kept in mind that this research only investigates emergency financial assistance that has been actually disbursed and not only pledged, that has been disbursed within three weeks of the onset of a catastrophe and that has been disbursed and recorded through the United Nations Office for the Coordination of Humanitarian Affairs Financial Tracking System (OCHA-FTS).

Figure 4.4.1.4. Disbursements and fatalities for the 21 days following a disaster (US$)




*Source: Elaborations of the author on data provided by the International Emergency Events Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL) and the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (OCHA).*

Figure 4.4.1.4 illustrates the relationship between the disbursements and the recorded number of fatalities for each of the humanitarian crises under investigation in the January 1st 2000 to December 31st 2008 period of analysis.

Observing the graph, it is immediately apparent a pre and a post-tsunami divide in the relationship between the number of fatalities recorded in each humanitarian crises and the emergency financial disbursements provided by the Dutch government. The December 26th, 2004 tsunami caused over 226,000 fatalities and was awarded almost US$ 22,000,000 in emergency financial assistance by The Netherlands. This disbursement took place six days following the tsunami and was both preceded and followed by two other almost symbolic instalments: two instalments amounting to a total of just over US$ 100,000 within 3 days of the tsunami and two instalments amounting to a total of just over US$ 900,000 almost three weeks after the tsunami. The disbursements dedicated to the tsunami were therefore both speedy and significant, in line with the extremely high number of fatalities reported.

A relatively similar situation also took place for what concerned the Gujarat earthquake (India) of January 26th, 2001. Against a reported total of slightly over 20,000 fatalities, the Dutch government released within 6 days emergency financial assistance worth almost US$ 3.5 million. Also in this case, the financial disbursements provided by the Dutch government seemed both timely and consistent with the total number of fatalities recorded in the earthquake.

While for the January 2001 Gujarat earthquake and the December 2004 tsunami the Dutch government responded positively to the request for emergency financial assistance, the data does not show any financial disbursements from February 2005 onwards. This is the case independently of the total number of fatalities recorded in different catastrophes: both natural disasters that recorded extremely high number of fatalities (such as cyclone Nargis with almost 140,000 fatalities) or those that recorded relatively few fatalities (such as the Java earthquake with less than 6,000 fatalities) did not receive any emergency financial assistance from the Dutch government as recorded through OCHA's Financial Tracking System.

### 4.4.2. Data analysis for the "humanitarian mechanism" hypothesis

While the previous chapter quantitatively dealt with the first two hypotheses under investigation, this chapter investigates the "humanitarian mechanism" explanation by qualitatively exploring the four independent variables selected for it.

1. Internationalisation

The evidence suggests that the Dutch humanitarian mechanism is and has for a long time been significantly embedded within the broader international humanitarian system. A historically high degree of internationalisation of the Dutch humanitarian system can be re-conduced to the extent and number of international initiatives in which the Netherlands have participated over the years.

To begin with, the Netherlands has been a funding member of the Organisation for Economic Cooperation and Development's Development Assistance Committee (DAC) since its inception in 1961. It therefore contributed to the very first attempts made by the international community to develop and institutionalise policies dedicated to the alleviation of poverty in economically less developed countries. Secondly and much more recently, the Netherlands is since 2003 a founding member of the Good Humanitarian Donorship initiative for the exchange of best practices aimed at improving the provision of humanitarian and development assistance. Thirdly, Amsterdam is party to the February 2005 Paris Declaration on Sustainable Donorship and the subsequent Accra Agenda for Action (AAA): it therefore worked closely with major OECD donors to provide the humanitarian agenda with new impetus. Fourthly, the Netherlands has gone beyond the efforts made by many of its partners and not only signed up to but also published all relevant data within the International Aid Transparency Initiative (IATA). Finally, assessments carried out by various research institutions such as Development Assistance Research Associates (DARA) and by the Global Humanitarian Assistance (GHA) research group all agree in claiming that the Netherlands is a country strongly committed to the international humanitarian community displaying above-average policy performances (DARA 2010; GHA 2011)

2. Financial commitment

The Netherlands is one of the countries that score very high marks when it comes to financial commitment to the provision of emergency humanitarian assistance as well as, more broadly, long-term development assistance. A number of key findings support such a statement.

To begin with, the Netherlands dedicates an impressive percentage of its Gross National Income (GNI) to the provision of Overseas Development Assistance (ODA). Indeed, with an average of 0.80% of its GNI dedicated to ODA throughout the period of analysis, the Netherlands comes second only to Denmark (0.88%) and significantly above the average obtained by all donor countries taken into consideration in this dissertation (UNData 2011).

Such a positive performance is confirmed by the fact that the Netherlands comes just behind Denmark also in terms of emergency humanitarian assistance as a percentage of Gross National Income (GNI) disbursed for the ten natural disasters under investigation. Indeed the Netherlands provided about 0.0007% of its GNI in emergency financial assistance to the disaster-stricken countries analysed in this dissertation thus once more highlighting its above average performance in terms of financial commitment to humanitarian assistance.

From a more historical perspective, the Netherlands has over the years shown a long-standing commitment to provide substantial financial resources for development and humanitarian aid policies. The Homogenous Budget for International Cooperation (HGIS) is the financial tool through which the Netherlands provides both short-term and long-term assistance to economically less developed countries. This is divided into two main budget lines: Overseas Development Assistance (ODA) expenditure and non-ODA expenditure. The ODA component of the HGIS' budget has traditionally automatically been set at 0.8% of Dutch GDP. Such an arrangement has ensured for many years that the amount available for development and humanitarian assistance would have increased or decreased in line with changes in the country's GDP. Unfortunately, this policy changed in 2011 as result of the coalition agreement signed by the political parties that formed the government following the autumn 2010 elections. The government agreement envisages, among other things, to cap the HGIS's budget at 0.7% of GDP from the fiscal year 2011 onwards (VVD-CDA 2010). This is a lower percentage than the one dedicated to ODA in the past but still in line with the 0.7% of GDP target recommended within the framework of the Millennium Development Goals (MDGs).

3. Operational independence

A number of features contribute to nurture a situation whereby the Dutch humanitarian agency can benefit from a considerable degree of operational independence from undue political pressure. Such state of affairs contributes to ensure that Dutch humanitarian assistance is generally, although not always, provided according to politically neutral humanitarian criteria.

While overall responsibility for the provision of humanitarian assistance rests with the Minister for European Affairs and International Cooperation, a set of five top-level civil servants (a Secretary General, her Deputy and three Director-Generals) is clearly entrusted with operational control over whether and when to disburse which emergency financial

assistance to disaster-stricken countries. Indeed, while the Minister for European Affairs and International Cooperation (currently Dr. Ben Knapen) is entrusted with the political leadership of development and humanitarian aid policy under the overall supervision of the Foreign Minister (currently Prof. Uri Rosenthal), the two ministers delegate operational control of the humanitarian and development aid policies to five senior civil servants: the Secretary-General, the Deputy Secretary-General and three Director-Generals. The three Director-Generals are in charge of the Directorate-General for European Cooperation (DGES), the Directorate-General for Political Affairs (DGPZ) and the Directorate-General for Development Cooperation (DGIS) respectively with the latter in charge of the operational management of Dutch humanitarian and development aid policies. Each Directorate-General is, in turn, responsible for a series of Departments focussing on policy-related or support activities. The state of affairs described above contributes to limit the extent to which the political establishment can influence what should be decisions fundamentally taken according to humanitarian criteria from within the Directorate-General for Development Cooperation (DGIS).

Secondly, the way the Dutch development and humanitarian aid budget has been designed contributes to guarantee a significant degree of operational independence for DGIS. Indeed, the fact that Dutch Overseas Development Assistance (ODA) is planned over three-year cycles and that, as a rule, 8% of ODA is destined exclusively to the provision of humanitarian aid, help DGIS to retain a significant degree of planning and operational autonomy (B4C 2010). Such a state of affairs is further reinforced by the fact that funds allocated through the HGIS must compulsorily be spent on nine key policy themes that make up the fundamental policy areas of The Netherlands' foreign policy. The first policy theme focuses on strengthening the international legal order and worldwide respect for human rights. The second policy theme concentrates on fostering security, stability, good governance and providing humanitarian aid. The third policy theme is dedicated specifically to the strengthening of European cooperation in foreign policy issues. The fourth theme looks at ways of promoting increases in structural economic growth and poverty reduction in developing countries. Within this context, the fifth general objective is the promotion of social and human development, while the sixth policy area is dedicated to environmental protection. The seventh overarching policy objective consists in the best possible provision of assistance to Dutch nationals abroad and the management of immigration and asylum flows. The eight theme focuses on the promotion of Dutch culture and the Netherlands' image abroad. Finally, policy theme number nine covers the overall objective of promoting all other policies while at

the same time maintaining all expenditures and administrative costs as low as possible (Dutch Ministry of Foreign Affairs 2011).

While many observations point to a considerable degree of independence of the Dutch humanitarian agency from undue political influence, a look at the main recipients of the country's humanitarian assistance rises more than a highbrow. Indeed, an investigation of bilateral humanitarian flows between 2000 and 2008 highlights how, in a number of instances, the top recipients of bilateral assistance have been either countries that saw the involvement of the Dutch military (Kosovo, Afghanistan and Iraq) or countries that happened to have been Dutch colonies such as Indonesia (GHA 2011). Such a finding would therefore seem to suggest that, although the Netherlands channels the overwhelming majority of its humanitarian assistance through multilateral channels (see below), when it decides to channel it trough bilateral ones, it might end up doing so according to foreign policy objectives rather than strictly humanitarian considerations.

While a few selected countries account for a significant proportion of Dutch humanitarian disbursements, the Netherlands traditionally proved to be an exceptional supporter of multilateral organisations and, in 2008 alone, channelled 65.9% of its humanitarian aid through multilateral organisations. Indeed, 22% of Dutch humanitarian aid was dedicated to the Central Emergency Response Fund (CERF), the (CHF) and the (ERF), 19.8% went to support the activities of UNHCR, UNRWA and WFP and 24.1% was provided through a mixture of other multilateral channels. Humanitarian aid that was provided through non-multilateral organisations went to NGOs and civil society (16.4%), the European Commission (14.2%), the public sector (3.4%) and others (0.1%). Again for 2008 and as it has been the case for many years, The Netherlands was a steadfast supporter of United Nations' Consolidated Appeals Processes (CAPs) and provided US$ 171.4 million to support these as part of a total of US$ 632.9 million spent for Overseas Development Assistance (ODA). The ten first-tier recipients of humanitarian aid in 2008 were the European Commission with US$ 96.3 million, the United nations' Office for the Coordination of Humanitarian Affairs with US$ 89.1 million, the World Food Programme with US$ 70.6 million, the United Nations High Commissioner for Refugees with US$ 68.9 million, the United Nations Development Programme with US$ 59.2 million, the International Committee of the Red Cross (ICRC) with US$ 46.9 million, the United Nations Relief and Works Agency (UNRWA) with US$ 30.2 million, the International Bank for Reconstruction and Development (IBRD) with US$ 24.3 million, The Netherlands Red Cross with US$ 22.3 million and the Office of the

President with US$ 11.4 million (GHA 2011). For all the reasons mentioned above, The Netherlands can take pride in being one of the countries that show greatest commitment to the provision of humanitarian aid worldwide. Total Official Development Assistance (ODA) provided by The Netherlands to the developing world continuously increased between 2004 and 2008. Unfortunately, this positive trend went into reverse in 2009 and is likely to accentuate itself in the coming years following the spending cuts decided by the Dutch government in the fall of 2010 (DEVEX 2010).

4. Administrative capacity

The humanitarian mechanism that revolves around the Dutch government's provision of humanitarian assistance is characterised by a high degree of administrative capacity. Indeed, a number of observations point to a state of affairs whereby the administrative capacity of the Dutch humanitarian agency scores good results.

To begin with, the fact that the Netherlands can count on the work of a dedicated unit that focuses only on humanitarian interventions is bound to enhance the quality of the country's humanitarian response. Indeed, within the Directorate-General for International Cooperation (DGIS), the Human Rights and Peace Building Department (DMV) is responsible for the planning, management and delivery of emergency humanitarian aid. The DMV is in turn made up by the humanitarian aid division (DMV/HH), the human rights division (DMV/MR) and the peace-building and good governance division (DMV/VG). These three divisions are all embedded within the Human Rights and Peace Building Department and work in partnership to ensure the provision of emergency humanitarian aid to disaster-stricken countries on behalf of the Dutch government.

Secondly, the Dutch humanitarian mechanism is characterised by a significant degree of coordination between different humanitarian departments on the one hand and streamlined administrative procedures on the other. Such a state of affairs is characterised by a situation whereby the Dutch Foreign Ministry is both fully responsible for the financing of the Homogenous Budget for International Cooperation (HGIS) and for the management of humanitarian aid on behalf of the Dutch government. In a context whereby the Dutch MFA finances 91% of the HGIS while at the same time incorporating within its structures the humanitarian aid division (DMV/HH), the human rights division (DMV/MR) and the peace-building and good governance division (DMV/VG) under the aegis of the Human Rights and Peace Building Department, resources and skills are all housed under the same roof thus

favouring greater coordination when selecting the timing for targeted disbursements of emergency financial assistance.

Thirdly, the presence of an institutionalised forum where key stakeholders of the Dutch humanitarian mechanism can exchange best practices and coordinate their policies contributes to the effectiveness of the Dutch humanitarian mechanism. The independent National Committee for International Cooperation and Sustainable Development (NCDO) was established by DGIS' humanitarian divisions in order for it to be able to liaise with key stakeholders in a regular and official format. Indeed, the establishment of new and relatively streamlined administrative procedures that enhanced the effectiveness of the Dutch humanitarian mechanism occurred partly as the result of the dialogue established with relevant humanitarian stakeholders through the NCDO. On the one hand, the establishment of Channel Financing Agreements between the Dutch Ministry of Foreign Affairs and the ICRC and UN agencies as well as a more widespread use of earmarked funding has greatly improved the predictability and the timeliness of Dutch humanitarian assistance. On the other hand, the streamlining of reporting requirements for implementing NGOs has had the positive result of reducing the administrative burden placed upon DGIS' humanitarian divisions themselves (IOB 2006).

Finally, the Dutch humanitarian mechanism can count on a state apparatus that puts at its service considerable financial resources in a reliable and predictable fashion. Significant financial resources and enhanced predictability of the funds available are indeed two key strengths of the Dutch humanitarian system. On the one hand, the Netherlands' humanitarian budget has for a long time been run according to a three-year plan. Because of that, DGIS always had the opportunity to strategically plan its financial operations and commitments. On the other hand, the fact that for many years 0.08% of Dutch GNI was automatically dedicated to the financing of Dutch humanitarian activities has provided a constant and reliable source of financing for those. Such a state of affairs has for a long time enabled the Dutch humanitarian sector to count on significant amounts of financial resources in a reliable and timely way and, therefore, to enhance DGIS' administrative capacity.

### 4.4.3. Summary of the major findings for the Netherlands

As it has already been observed in the case of the United Kingdom, the Netherlands are also a country that subscribes to a significant extent to the findings recorded through the multiple regression analysis carried out for all donor countries combined. However, unlike the United

Kingdom, the Netherlands also provide some interesting insights into the potential correlation between disbursements of humanitarian aid and other independent variables.

To begin with, the Netherlands are perfectly in line with the results obtained by the multiple regression analysis carried out for all donor countries combined whereby the magnitude of a natural disaster under investigation is likely to have a significant impact on the extent to which the national government might be ready to disburse emergency humanitarian assistance to countries struck by a sudden natural disaster. Indeed and as it has already been observed in the case of the United Kingdom, the total number of fatalities recorded is a highly significant independent variable vis-à-vis the dependent variable made up by the actual disbursements of emergency humanitarian assistance.

Having said that, the provision of emergency humanitarian assistance on behalf of the government of the Netherlands could at first sight be explained also through the prism of the "domestic politics hypothesis". This is due to the fact that both the independent variable pertaining to the country's GDP as well as the one focussing on media coverage are recorded as highly significant by the multiple regression analysis. However, following a more careful analysis of these two independent variables for this specific donor country, such a hypothesis was rejected.

Last but not least, a qualitative investigation of the four independent variables selected to explore the hypothesis according to which the *modus operandi* of the humanitarian mechanism of a donor country could have a significant impact on the provision of humanitarian assistance to countries struck by a sudden natural disaster also provides interesting insights. Indeed, the Netherlands are a country that, compared to the other case studies under investigation, scores particularly well in all these four domains: the degree of independence of the country's humanitarian agency vis-à-vis the government, the country's overall financial commitment to the provision of Overseas Development Assistance (ODA), the country humanitarian agency's administrative capacity and the extent of its involvement within the international humanitarian community.

### 4.5. Spain

This fifth part of the chapter concerned with data analysis concentrates on the results obtained for Spain. This part of the chapter is therefore also developed in three sections: one section focussing on the quantitative analysis of the "domestic politics" and "disaster magnitude"

hypotheses, another one dealing with the qualitative investigation of the "humanitarian mechanism" hypothesis and a third one providing a summary of the major findings.

**4.5.1. Data analysis for the "domestic politics" and "disaster magnitude" hypotheses**

Figure 4.5.1.1. Multiple regression analysis for all the independent variables

Number of observations=210
Time periods=10

| log_disburse | Coef. | Std. Err. | P>\|z\| |
|---|---|---|---|
| gdpus | 0.462 | 0.346 | 0.182 |
| catastroph~y | -0.088 | 0.037 | 0.017* |
| clgovernment | -0.086 | 0.055 | 0.116 |
| election | 0.016 | 0.075 | 0.835 |
| fatalities | 0.045 | 0.048 | 0.348 |
| affected | 0.029 | 0.048 | 0.551 |
| damage | -0.024 | 0.055 | 0.662 |
| totarticles | 0.094 | 0.083 | 0.257 |
| _cons | -0.084 | 0.140 | 0.546 |

*Key:*

*log_disburse: Logarithmic disbursement (dependent variable)*

*gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation*

*catastroph˜y: Catastrophe day (days elapsed since the onset of a selected natural disaster)*

*clgovernment: Centre-left government (presence or not of centre-left parties in government)*

*election: Election (presence or not of electoral period in the donor country)*

*fatalities: Fatalities (number of fatalities recorded for natural disaster under investigation)*

*affected: Affected (number of people affected by the natural disaster under investigation)*

*damage: Damage (estimated damages recorded for the natural disaster under investigation)*

*totarticles: Total articles (total articles recorded on the natural disaster under investigation*

*_cons: Constant*

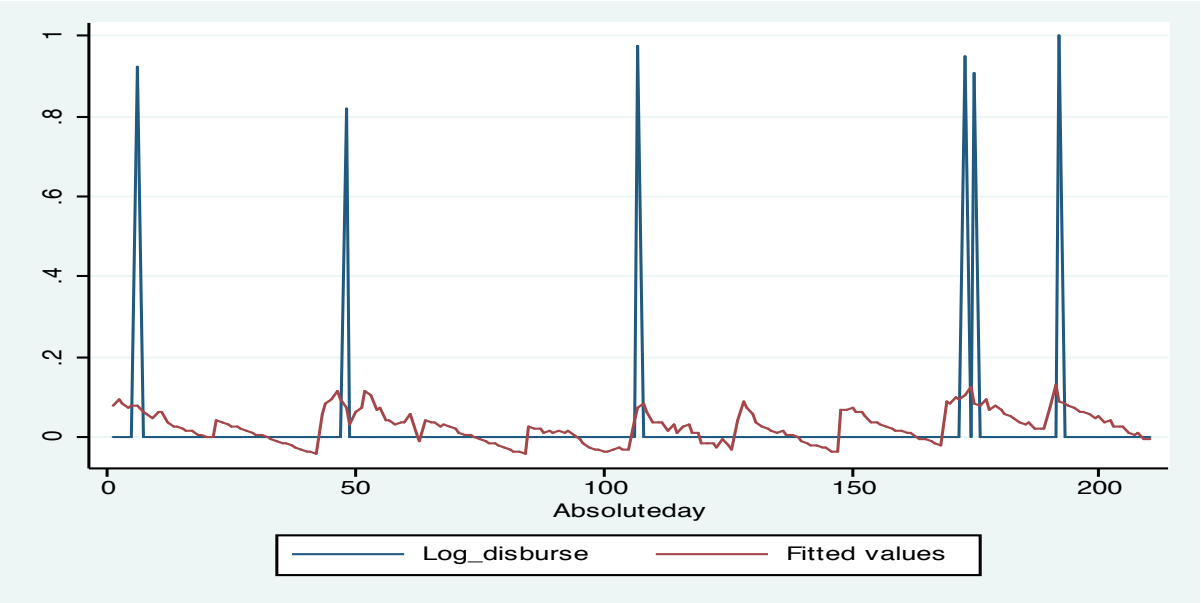
*Source: the author.*

Figure 4.5.1.1 presents the results for the Multiple Regression Analysis (MRA) with Generalised Least Squares (GLS) carried out for Spain for the ten natural disasters under investigation in the period of analysis running from the 1st of January 2000 to the 31st of December 2008.

Figure 4.5.1.1 shows a P > z value of 0.017 for the variable concerned with the number of days that have elapsed since the onset of a natural disaster: there exists therefore a 99% probability that this investigated independent variable has an effect on the dependent variable represented by the disbursements of humanitarian assistance. Conversely, such a P > z value indicates that there is only 1% likelihood that the obtained value is the result of random distribution. Still looking at the independent variables, the highest absolute value recorded for the coefficients is the one for the variable relating to the donor country's GDP (0.462). However, unlike the independent variable for the number of days that have elapsed since the onset of a natural disaster (coefficient of -0.088), the variable represented by the country's gross domestic product is not significant (P > z value of 0.182). The most significant independent variable in determining the value of the dependent variable is therefore the number of days that have elapsed since the onset of a humanitarian catastrophe. When the relevant diagnostics are run for the regression, no multicollinearity is detected between the variables under investigation.

The data obtained for Spain through the multiple regression analysis provides interesting insights that can be summarised in three main points. To begin with, the number of days that have elapsed since the onset of a natural disaster is the variable most likely to account for variation in the levels of provision of humanitarian assistance provided to countries struck by a sudden natural disaster. Secondly, while the finding presented above seems to confirm the hypothesis according to which the magnitude of a natural disaster is the factor most likely to influence the disbursement of humanitarian assistance, the country's domestic politics seem to have no bearing on the extent to which the Spanish government might be ready to disburse emergency humanitarian assistance. Last but not least, the fact that the number of days that have elapsed since the onset of a natural disaster seems to be such a significant explanatory variable, suggests that greater research should be dedicated to explore the response mechanisms of the Spanish humanitarian agency and the speed at which this is in a position to respond to a sudden natural disaster.

Figure 4.5.1.2. Comparison of the observed and the predicted values of the disbursements

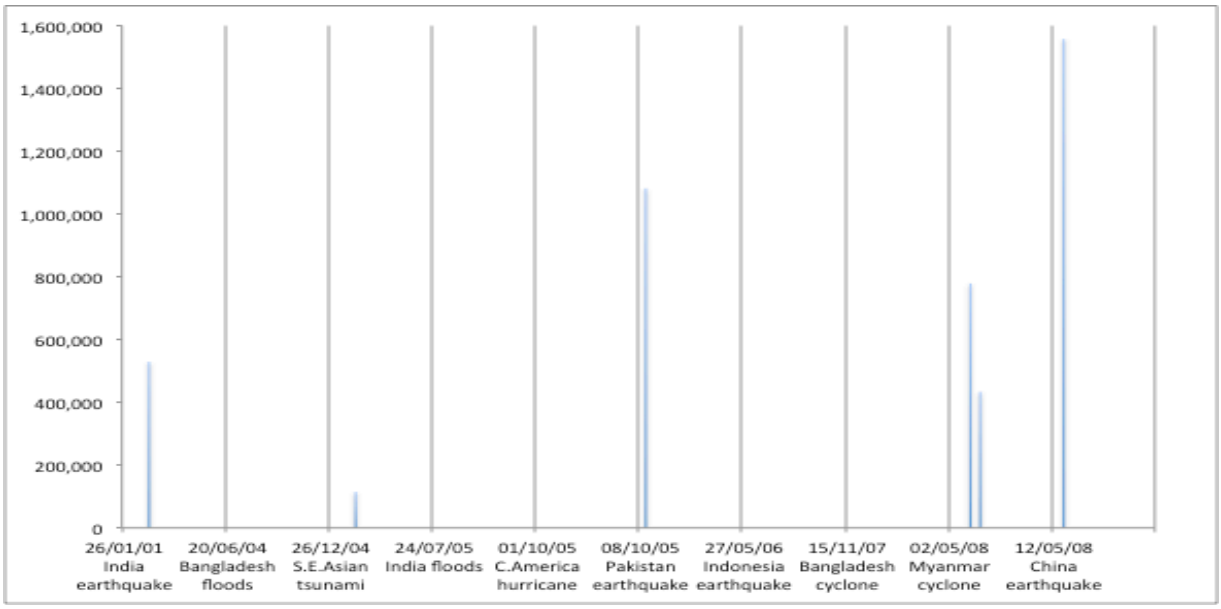



*Source: the author.*

Figure 4.5.1.2 shows the logarithm of the disbursement and its estimated values for the twenty-one days following each one of the ten natural disasters under investigation.

After having carried out the generalised least squares estimation, the corresponding mathematical model is presented in graphic format in order to show the estimation of the dependent variable throughout the period of analysis and in relation to specific crises. What the graph clearly shows is that, while at times a predicted disbursement might not take place, the model never fails to predict a disbursement that will subsequently effectively be recorded. In the case of Spain, the model adequately predicts eventual disbursements of emergency humanitarian assistance for all those instances when disbursemnts have indeed taken place. This is the case for the earthquake that struck Gujarat on the 26$^{th}$ of January 2001, the South-East Asian tsunami of the 26$^{th}$ of December 2004, the earthquake in Pakistani-controlled Kashmir on the 8$^{th}$ of Occtober 2005, the cyclone that struck Myanmar on the 2$^{nd}$ of May 2008 and the Sichuan earthquake of thee 12$^{th}$ of May 2008.

Figure 4.5.1.3. Disbursements for the 21 days following each natural disaster (US$)




*Source: the author on elaborations from the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA).*

Figure 4.5.1.3 illustrates the disbursements of emergency financial assistance provided by the Spanish central government in response to the ten natural catastrophes under investigation for the January 1st, 2000 to December 31st, 2008 period. While only a few disbursements took place within the whole period of analysis, it was nevertheless decided to include this figure for the sake of coherence and for comparative purposes with the same figure offered for other donor countries.

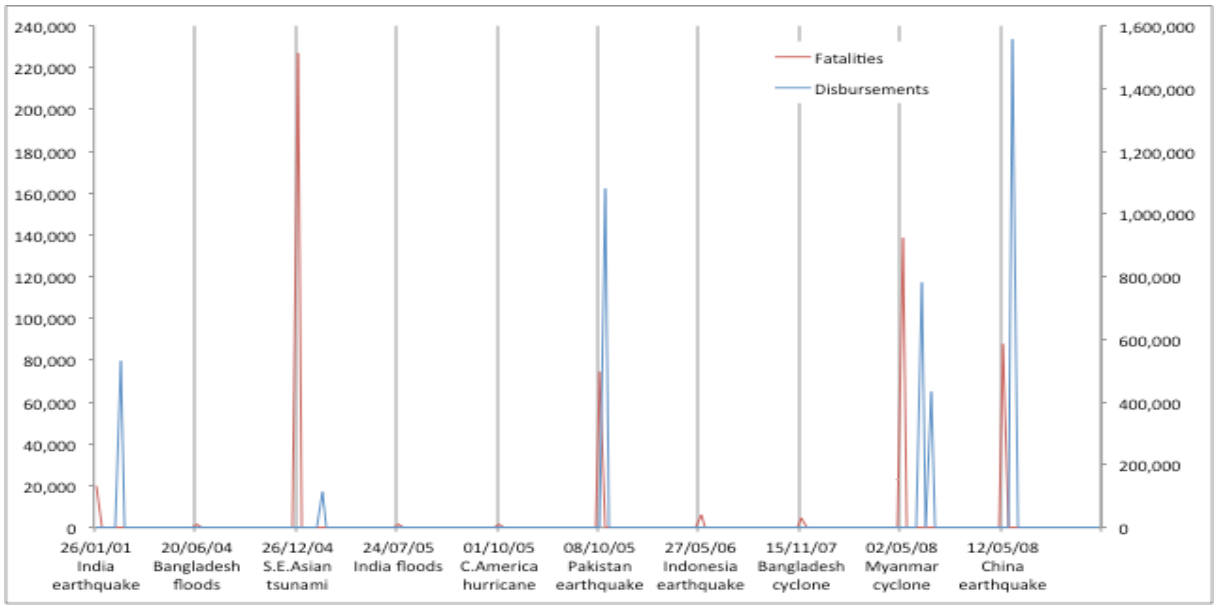
The single largest disbursement took place in response to the earthquake that struck the Sichuan province (China) on the 12th of May 2008 and came about a merely 48 hours following the quake itself: such disbursement was worth slightly less than US$ 1,600,000. The second largest disbursement took place on the 9$^{th}$ of October 2005: merely 24 hours after the earthquake that shook Pakistan-controlled Kashmir and it consisted of well over US$ 1,000,000 in emergency financial assistance. Following the landfall of cyclone Nargis on Myanmar on the 2nd of May 2008, the Spanish government released two almost consecutive disbursements that, together, represented the second-largest disbursement for any of the 10 natural disasters under investigation. A first disbursement of almost US$ 800,000 was followed 48 hours later by a second disbursement of over US$ 400,000, for a total of over US$ 1,200,000. Interestingly, both of these two disbursements took place almost one week

into the humanitarian catastrophe: a response, this one, much slower than the ones displayed by the Spanish government in occasion of both the Sichuan and the Kashmir earthquakes.

As in the case of cyclone Nargis, the Gujarat earthquake (India) of the 26th of January 2001 recorded a delayed delivery of emergency financial assistance with one and much smaller disbursement of just above half a million US$ taking place a full 5 days following the quake itself. Even more surprisingly and unlike in most of the other case studies under investigation, the smallest recorded disbursement took place in response to the December 2004 tsunami and it was limited to only US$ 115,000. While it might come as a surprise to observe at first sight that only such a limited disbursement was released in the face of the South East Asian tsunami, it should be kept into account that the assistance provided might have been, and indeed it was, of a different and non-financial nature: to respond to the tsunami, the Spanish government mobilised military assets rather than only financial assistance.

Last but not least, the graph clearly illustrates the fact that, against of a total of 10 natural disasters being investigated within our period of analysis, the Spanish central government provided emergency financial assistance only in 5 humanitarian crises. On the other hand, the Bangladesh floods of June 2004, the Indian floods of July 2005, Hurricane Stan in October 2005, the Java earthquake of May 2006 and the cyclone that struck Bangladesh in November 2007: none of these catastrophes spurred the short-term provision of emergency humanitarian assistance as recorded through the UN-based Financial Tracking Service.

Figure 4.5.1.4. Fatalities and disbursements for the 21 days following a disaster (US$)




*Source: Elaborations of the author on data provided by the International Emergency Events Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL) and the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (OCHA).*

Figure 4.5.1.4 illustrates the disbursements provided by the Spanish central government following each humanitarian catastrophe under investigation as well as the total number of fatalities recorded for each catastrophe.

Unlike as it has been in a number of other case studies and as it is confirmed by the multiple regression analysis in figure 4.5.1.1, disbursements of humanitarian assistance do not correlate to the magnitude of a natural disaster understood as the number of recorded fatalities. Indeed, two catastrophes that registered a relatively similar number of fatalities (the Pakistani earthquake with over 74,000 fatalities and the Sichuan earthquake with over 87,000 fatalities) received markedly different levels of emergency financial assistance from the Spanish government. Pakistan received slightly over US$ 1,000,000 while China received almost 50% more with aid worth almost US$ 1,600,000. In both cases, emergency financial assistance was disbursed immediately after the earthquakes took place.

A third earthquake (Gujarat in January 2001) saw emergency assistance worth just above US$ 500,000 in line with a much smaller number of recorded fatalities. Here, nevertheless, the disbursement of emergency financial assistance was not as speedy as in the case of the two

earthquakes mentioned above and one week passed following the earthquake before the Spanish government authorised the disbursement.

A story of its own must be told for what concerns cyclone Nargis in May 2008. The second-largest catastrophe in terms of fatalities in our sample, the victims of cyclone Nargis were offered two instalments of emergency financial assistance amounting to a total of approximately US$ 1,200,000. This was the second-largest provision of humanitarian aid within our sample (after the assistance provided following the Sichuan earthquake) but was offered in two instalments, both taking place almost a week following the landfall of cyclone Nargis on Myanmar. The peculiar political situation in the country and the fear that aid might have been mismanaged might explain the disbursement of separate instalments and the relative slow reaction in providing the payments.

The fifth and last humanitarian catastrophe to have received financial assistance was the December 2008 tsunami. By far the biggest catastrophe in terms of total fatalities recorded, the victims of the tsunami received only slightly over US$ 100,000 from the Spanish central government. A data, this one, that although surprising, must be carefully interpreted in the light of of other factors such as the donations of Spanish autonomous regional governments, the provision of emergency financial assistance outside the Financial tracking System (FTS) operated by the UN Office for the Coordination of Humanitarian Affairs (OCHA) and the donations in kind (Spain sent the navy and various military units to provide emergency assistance) that followed the disaster.

Finally, it must be observed that for 5 out of the 10 humanitarian disasters under investigation, the Spanish government provided no emergency financial assistance (at least through the UN-managed FTS). The victims of the June 2004 Bangladesh floods, the July 2005 Indian floods, the October 2005 hurricane Stan, the Java earthquake of May 2006 and cyclone Sidr in November 2007 received no emergency financial assistance whatsoever.

### 4.5.2. Data analysis for the "humanitarian mechanism" hypothesis

While the previous chapter quantitatively dealt with the first two hypotheses under investigation, this chapter investigates the "humanitarian mechanism" explanation by qualitatively exploring the four independent variables selected for it.

1. Internationalisation

Spain displays characteristics typical of a country that has only recently started to play a significant role within the international humanitarian community but that is rapidly becoming a significantly more prominent actor. A number of observations support such a view.

To begin with and when investigating the Spanish case study, it is particularly interesting to observe that Spain has become a member of the Organisation for Economic Cooperation and Development's Development Assistance Committee (DAC) only in 1991. Spain has therefore joined DAC exactly three decades after the organisation had originally been established. Such a development should not surprise in that it is in line with the exceptional economic development that the country enjoyed since the end of Franco's dictatorship in 1975 and the possibilities that it opened for the country to start playing a more active role on the international stage. While Spain is a relative newcomer to the international donor community, Madrid is rapidly becoming one of its key players. Indeed, following its "late start" within the international aid community, Spain has over the last two decades taken a number of important steps to join its European partners on the international humanitarian stage. Indeed, the fact that Spain joined the Global Humanitarian Donorship (GHD) initiative, that is swiftly adhered to the Paris Declaration on Aid Effectiveness and the subsequent Accra Agenda for Action (AAA) and that it has already published data within the framework of the International Aid Transparency Initiative (IATI) are all clear signs of Madrid's commitment to make up for the late start that it had accumulated in joining the international humanitarian community (GHA 2011). Even more significantly, Spain has over the years taken increasingly significant steps to match its increased diplomatic involvement to join the international aid community with concrete financial commitments worth of the role that it wishes to play.

2. Financial commitment

The extent of the financial commitment that Spain is ready to dedicate to the provision of Overseas Development Assistance (ODA) mirrors the on going transformation of the country from a marginal donor to a key player within the international development and humanitarian communities.

While a first cursory look at Spain's ODA levels might give the impression that Madrid is not particularly committed to the provision of both long and short-term assistance to less economically developed countries, a more thorough examination of recent historical patterns suggests that the country is undergoing profound changes in the role it plays in the

international humanitarian arena. When one first compares the percentage of Gross National Income (GNI) that Spain dedicates to the provision of Overseas Development Assistance (ODA) to the one provided by the other six countries under investigation, Madrid does not fare well. Indeed, within the whole period of analysis, Spain dedicated only 0.29% of its GNI to the provision of ODA against the average 0.46% provided by all seven case studies under investigation (UNData 2011). This below average performance is mirrored by the one that, within the same period of analysis, Spain recorded vis-à-vis its European peers when it came to the provision of emergency humanitarian assistance for the victims of the ten natural disasters under investigation. Indeed, for all the natural disasters under investigation, Spain dedicated only 0.0001% of its Gross National Income (GNI) to the provision of emergency humanitarian assistance. A percentage that compares poorly with the higher percentages of GNI committed by all the other six donors under investigation.

While such initial impressions are far from positive, Spain's performance can be seen in a more favourable light when one starts to adopt a more historical perspective. Indeed, while Spain's average expenditure for both humanitarian and development aid for the whole period of analysis is well below the one recorded by the other donor countries under investigation, a significantly encouraging trend can be observed through the years. This positive trend started in 2003 and took shape in the form of the steady increases in funding made available for both development and humanitarian aid from 2005 onwards under both the first and the second socialist governments of Prime Minister Zapatero. Indeed, throughout its time in office, Zapatero's government virtually doubled Spanish funding for humanitarian aid bringing it from a 2005 level of US$ 326 million to a 2008 level of US$ 629 million. Total ODA also significantly increased from US$ 3.2 billion in 2005 to US$ 6.5 billion in 2008. Indeed, in 2008 humanitarian aid accounted for 9.6% of all Spanish Overseas Development Aid (ODA): a percentage significantly higher than the average 7.4% of total ODA recorded for the 1995 to 2007 period as a whole (GHA 2011). As result of what has been highlighted above it can be claimed that, although not yet exceptional, the amount of financial resources dedicated by the Spanish government to the provision of humanitarian and development aid has been steadily and significantly increasing over time.

3. Operational independence

Spain displays mixed results when one investigates the degree of operational independence that its humanitarian agency enjoys from undue political pressure. Indeed, a number of facts contribute to paint a contradictory picture whereby Spain's humanitarian agency is not always

granted the operational independence needed to carry out its mission solely according to humanitarian criteria.

To begin with, the Spanish humanitarian mechanism seems to be characterised by a state of affairs whereby the separation between political responsibility and operational control is not particularly clear-cut. Indeed, while at the political level the Secretary of State for International Cooperation is supposed to support the Spanish Foreign Minister by chairing the presidency of the Spanish Agency for International Cooperation and Development (AECID), at the administrative level the AECID's director is supposed to be concerned with the daily operational management of development and humanitarian activities. Within this context it is therefore disturbing to observe that reports of malpractice have been emerging within the context of the appointment procedure of the director himself: Mr. Francisco Moza Zapatero (ABC 2010).

Secondly and in contrast to what has been observed for other countries, Spain does not seem to have yet taken any substantial legislative initiatives in order to shield the provision of emergency humanitarian assistance from the eventual interference of the political establishment. Law 23 of the 7th of July 1998 on International Cooperation and Development provides the basic framework for Spain's provision of both long-term development aid and emergency humanitarian assistance (AECID 2011). While such a law did not envisage any specific provisions to "shield" Spanish humanitarian assistance from undue political pressure, it is a disappointment to observe that even the law that has been approved by the Spanish Cortes in 2010 to amend the existing development and humanitarian aid legislation (law 941 of the 23rd of July 2010) has failed to address this issue (AECID 2011).

Thirdly, an investigation of the main recipients of Spanish humanitarian aid seems to suggest that non-strictly humanitarian criteria too often seem to determine the destination of Spanish emergency humanitarian assistance. Indeed, recipients of Spanish humanitarian assistance that display linguistic, cultural and historical ties to Madrid seem to feature highly among the key recipients of Spanish humanitarian aid. In this respect, El Salvador, Venezuela, Argentina, Colombia, Guatemala, Nicaragua or Peru always featured among the top ten recipients of Spanish humanitarian aid throughout all the years under investigation bar for 2008 (GHA 2008). Such a state of affairs suggests that geopolitical and strategic interests might still play a significant role when it comes to deciding which countries should be benefit from Spanish humanitarian assistance. Furthermore, a focus on the Central and South American regions can be observed also for what concerns the overall activities of the Spanish Agency for

International Cooperation and Development (AECID). Indeed, the fact that AECID has a Directorate specifically dedicated to Latin America and the Caribbean and that in 2008 it set up its own "Humanitarian Logistics Centre" in the Republic of Panama (two occurrences that do not take place for any other region of the world) is emblematic of the special attention that Madrid dedicates to its former colonies.

Finally, while an analysis of the main recipients of Spanish humanitarian aid seems to suggest that foreign policy criteria still play a significant role in determining which countries are most likely to become recipients of Spanish aid, an investigation of the funding channels chosen by Spain seems to offer hope that the decision to provide aid disbursements might over time become increasingly dependent on more strictly humanitarian criteria. This hope is justified by the fact that, throughout the period of analysis, humanitarian aid channelled via pooled funding mechanisms as well as the share of humanitarian aid channelled via the United Nations' Consolidated Appeal Process (CAP) have seen both steady and substantial increases (GHA 2011). This is a trend that is indeed also confirmed by data available for the last year of the period under investigation. The Spanish government in 2008 channelled over half of all its humanitarian assistance (51.7%) through multilateral organisations. More specifically, UNHCR, UNRWA and WFP received 6.3% of total Spanish humanitarian aid; the CERF, the CHF and the ERF accounted for 9.7% of all funding for humanitarian aid and other multilateral organisations received an additional 35.6% of the total of Madrid's humanitarian aid. NGOs and civil society were granted 11.5% of all Spanish humanitarian aid, the public sector received 9.4% of the total and other disbursements accounted for 2.3% of total humanitarian aid provided (GHA 2011). Indeed, a specific analysis for the last available year of investigation (2008) confirms that Spain proved itself to be a strong supporter of multilateral humanitarian aid funding mechanisms and, with a contribution of over US$ 45 million, ranked fifth (behind the United Kingdom, The Netherlands, Sweden and Norway) among donors to the Central Emergency Response Fund (OCHA 2011). Within this context, it is interesting to observe that the Spanish government proved itself to be a a strong supporter of European Union's humanitarian aid: the European Commission in 2008 was by far the single largest first-tier recipient of Spanish humanitarian aid and was provided with US$ 162.7 million or 25.2% of all Spanish humanitarian aid for that year. Still in 2008, WFP was the second largest first-tier recipient of Spanish humanitarian aid with US$ 92.9 million followed by the World Bank with US$ 51.2 million. The Spanish Agency for International Cooperation and Development (AECID) and the United Nations' Office for the Coordination of Humanitarian Affairs (OCHA) were tied in fourth and fifth position with funding for US$

51.1 million while UNHCR came a close sixth with US$ 48 million. UNDP and the United Nations Relief and Works Agency (UNRWA) occupied seventh and eight spot each with funding in the order of US$ 29.7 million and US$ 24.6 million respectively. Finally still making into the top-ten first-tier recipients of Spanish humanitarian aid in 2008, the United Nations Development Group (UNDG) and the Food and Agriculture Organisation (FAO) received US$ 14.4 million and US$ 11.3 million each.

4. Administrative capacity

The overall administrative capacity of the Spanish humanitarian agency is characterised by both positive features and by situations that hamper its effectiveness. A number of observations might shed light on both the strengths and weaknesses that currently characterise AECID's administrative capacity in the field of humanitarian assistance.

To begin with, the Spanish Agency for International Cooperation and Development (AECID) can rely upon the work of a specialised Humanitarian Department. Such a department plays indeed a fundamental role within AECID thanks to two fundamental characteristics. On the one hand, the humanitarian office finds itself under the direct responsibility of AECID's director: it therefore has privileged access to the top echelons of AECID's administrative structure. On the other hand, because it is tasked with the coordination not only of the acute phase of a humanitarian emergency but also with the transitional process from humanitarian assistance to development aid, the influence that AECID's humanitarian office can exercise within AECID's broader administrative structure is enhanced.

While the humanitarian office plays a prominent role within AECID's centralised structure, the overall provision of Spanish humanitarian assistance is still hampered by the fragmentation of the Spanish humanitarian humanitarian system between centralised and regional administrations. Indeed, aside from the role played by the Spanish central government in Madrid through the Spanish Agency for International Cooperation and Development (AECID), a key characteristic of the country's humanitarian system is represented by the significant role played by the *autonomias* (regional administrations) in contributing to the provision of humanitarian assistance to disaster-stricken countries worldwide. While the Spanish Agency for International Cooperation and Development (AECID) is located within the Ministry of Foreign Affairs and Cooperation and manages the provision of development and humanitarian aid on behalf of the Spanish state as a whole, Spain's institutional architecture is characterised by the presence of seventeen highly

autonomous regions. Sixteen of these regions have their own international cooperation laws with six of them even possessing independent agencies for the management and provision of humanitarian and development aid (GHA 2011). Such a state of affairs is unfortunately bound to contribute to duplication processes and inefficiencies in the provision of emergency humanitarian assistance.

Aside from an exceptional degree of decentralisation, a limited amount of coordination with key stakeholders within the Spanish humanitarian community might further contribute to limit the potential of the Spanish humanitarian mechanism. Indeed, while the majority of Spanish humanitarian NGOs have set up an umbrella organisation to coordinate their positions vis-à-vis the Spanish government; no institutionalised, regular and structured forum has to date been set up for AECID to be able to coordinate its policies with the umbrella organisation and the NGOs themselves. Such a state of affairs inevitably makes it more difficult for AECID to take advantage of the resources that could come from the Spanish humanitarian community and, it turn, it limits the effectiveness of its implementation programmes.

Finally and this time on a rather positive note, it shall be noted that AECID is being granted steadily increasing financial resources to carry out its mandate. As result of these endowments and as already pointed out previously, the absolute amount of Overseas Development Assistance (ODA) as well as the specific financial resources dedicated to humanitarian assistance managed by AECID have effectively more than doubled between the beginning and the end of the first decade of the 21$^{st}$ century (GHA 2011). These increasing financial resources are provided to AECID through a four-year Master Plan for International Cooperation that sets the overall strategy for more specific Annual Plans for International Cooperation. Each of these plans is in turn broken down into thirteen policy areas including humanitarian action (MAE 2005, MAE 2009). Such a relatively long-term planning horizon coupled with increasing financial resources should help AECID to improve its administrative capacity over the years.

### 4.5.3. Summary of the major findings for Spain

In line with the findings already obtained through the multiple regression analysis carried out for all countries combined as well as with those recorded for the United Kingdom and the Netherlands, the Spanish case study subscribes to the "magnitude of the humanitarian disaster" hypothesis. However, a number of qualifications should be added in this respect.

To begin with, it appears clear that, in the case of Spain, the number of days that have elapsed since the onset of a natural disaster are by far the most significant variable accounting for the disbursement of emergency humanitarian assistance on behalf of the central government. However, while re-affirming the validity of the hypothesis already confirmed through the multiple regression analysis for all donor countries combined as well as the findings for the United Kingdom and the Netherlands, Spain differs from its partners in that the number of fatalities recorded for a humanitarian disaster does not seem to be a significant variable. The number of people affected by the disaster or the estimated damages that resulted from it do not seem to be relevant either.

Secondly and for what concerns the four independent variables investigated to explore the hypothesis according to which domestic politics play a key role in influencing the disbursement of emergency humanitarian assistance following the onset of a natural disaster, the results allow for the rejection of the hypothesis itself. Indeed, none of the four investigated variables (the country's GDP, the presence in power of a centre-left government, whether or not the country finds itself in the midst of an electoral period and the extent of media coverage on a selected natural disaster) are significant in influencing the dependent variable.

On top of the picture presented above, the qualitative analysis carried out for Spain presents a rather contradictory picture for what concerns the hypothesis according to which the *modus operandi* of a donor country's humanitarian mechanism influences the extent to which a national government is ready to provide emergency humanitarian assistance to countries struck by a sudden natural disaster. Indeed, within this context, Spain's performance falls somewhere in between the best and the worst performing countries investigated by this study: while still struggling to free itself from undue political interference and being hampered by a byzantine administrative structure, AECID is undergoing a quick process of internationalization and being entrusted with ever greater financial resources to manage. In this respect, Spain can be seen as a country in the midst of a transformation of its humanitarian aid sector.

### 4.6. Germany

This sixth part of the chapter dedicated to data analysis presents the results obtained for Germany. This part of the chapter is consists of three sections: one concerned with the quantitative analysis of the "domestic politics" and "disaster magnitude" hypotheses, one

focused on the qualitative investigation of the "humanitarian mechanism" hypothesis and a third one providing a summary of the major findings.

### 4.6.1. Data analysis for the "domestic politics" and "disaster magnitude" hypotheses

Figure 4.6.1.1. Multiple regression analysis for all the independent variables

Number of observations=210
Time periods=210

| log_disburse | Coef. | Std. Err. | P>\|z\| |
|---|---|---|---|
| gdpus | -0.162 | 0.429 | 0.706 |
| catastroph~y | -0.087 | 0.045 | 0.056* |
| clgovernment | 0.066 | 0.056 | 0.242 |
| election | -0.059 | 0.101 | 0.557 |
| fatalities | 0.168 | 0.056 | 0.003* |
| affected | -0.050 | 0.054 | 0.349 |
| damage | 0.092 | 0.063 | 0.146 |
| totarticles | 0.009 | 0.113 | 0.938 |
| _cons | 0.195 | 0.403 | 0.629 |

*Key:*

*log_disburse: Logarithmic disbursement (dependent variable)*

*gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation*

*catastroph˜y: Catastrophe day (days elapsed since the onset of a selected natural disaster)*

*clgovernment: Centre-left government (presence or not of centre-left parties in government)*

*election: Election (presence or not of electoral period in the donor country)*

*fatalities: Fatalities (number of fatalities recorded for natural disaster under investigation)*

*affected: Affected (number of people affected by the natural disaster under investigation)*

*damage: Damage (estimated damages recorded for the natural disaster under investigation)*

*totarticles: Total articles (total articles recorded on the natural disaster under investigation*

*_cons: Constant*

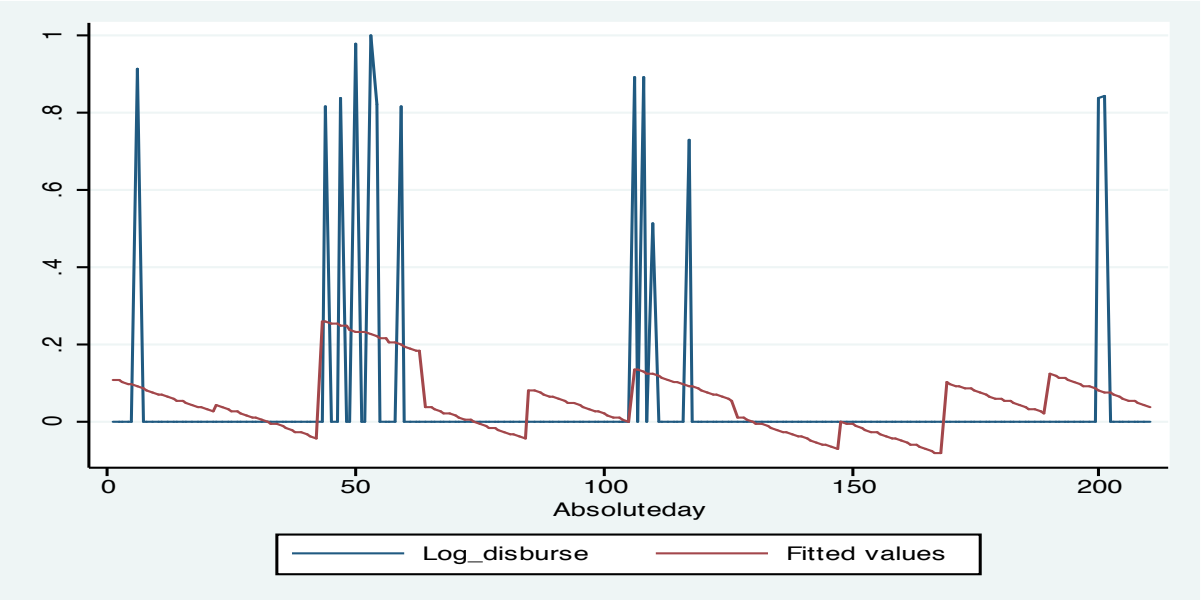
*Source: the author.*

Figure 4.6.1.1 illustrates the results obtained through the Multiple Regression Analysis (MRA) with Generalised Least Squares (GLS) for the Federal Republic of Germany for the ten natural disasters under investigation.

The P > z values of 0.003 and almost 0.056 for the variables pertaining to the number of fatalities recorded and the number of days elapsed since the onset of a natural disaster show that there is an almost 100% and 95% probability respectively that these two investigated independent variables have an effect on the dependent variable. Consequently, the data suggest that there exist only an almost 0% and 5% likelihood respectively that the obtained value is the result of random distribution. In terms of the coefficients of the independent variables, the highest absolute value to be found is the one that refers to the number of fatalities recorded. Indeed, the variable for the number of fatalities recorded displays both a very high absolute value for its coefficient (0.168) as well as a very significant P > z value of 0.003. The most significant independent variables in determining the value of the dependent variable are therefore the number of fatalities recorded and, to a much more limited extent, the number of days that have elapsed since the onset of a natural disaster. Following up on these results, multicollinearity is checked for by computing for the tolerance value and by regressing one of the explanatory variables on all other explanatory variables. The relevant regression diagnostics confirm that no problems of multicollinearity are identified in that there is no VIF value in excess of 20 and no 1/VIF value below .05.

In light of the results presented above, three main observations can summarise the findings pertaining to Germany. To begin with, the number of fatalities recorded for the investigated natural disasters as well as the number of days that have elapsed since the onset of the selected humanitarian emergencies clearly do account for variation in the extent to which the German government is ready to provide emergency humanitarian assistance to countries struck by a sudden natural disaster. Secondly, it shall be observed that, while the findings obtained confirm the research hypothesis according to which the magnitude of a natural disaster has a bearing on disbursements of humanitarian aid, the hypothesis according to which Germany's domestic politics might influence disbursements has to be discarded. Indeed, none of the relevant independent variables in this respect seems significant in relation to the dependent variable. Finally, it shall be pointed out that the results obtained for the specific German case study are significantly in line with those obtained through the multiple regression analysis that had been performed for all donor countries combined.

Figure 4.6.1.2. Comparison of the observed and the predicted values of the disbursements

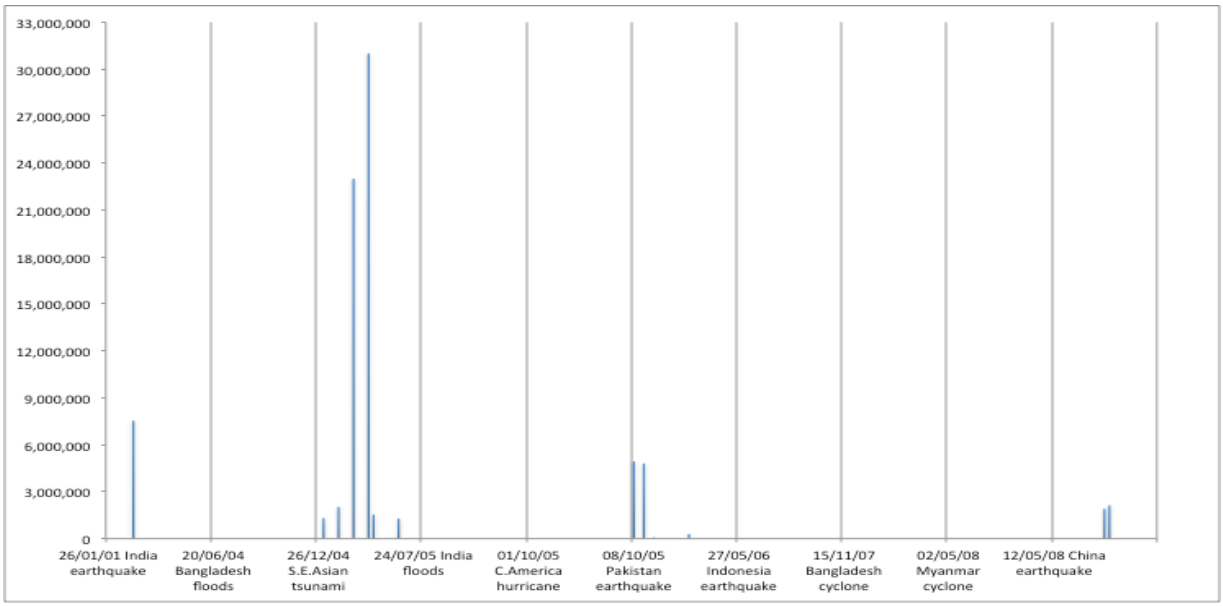



*Source: the author.*

Figure 4.6.1.2 presents the logarithm of the disbursement value for Germany and its estimated values for twenty-one days that follow each of the ten selected natural disasters.

Figure 4.6.1.2 corresponds to the estimate of the dependent variable on the generalised least squares estimation that had been previously carried out in figure 4.6.1.1. The added value of this graph rests with the fact that it visually illustrates the performance of the predicting value across the whole period of analysis. In this respect, while struggling to predict disbursements of emergency humanitarian assistance on the occasion of the earthquake that struck the Chinese province of Sichuan on the 12$^{th}$ of May 2008, the model very clearly predicts the disbursements that take place on the occasion of the South-East Asian tsunami of the 26$^{th}$ of December 2006 and the earthquake of the 8$^{th}$ of October 2005 in Pakistani-controlled Kashmir. As already highlighted before and while to a certain extent successfully managing to predict it, data pertaining to the Gujarat earthquake of the 26$^{th}$ of January 2001 should be treated with extreme caution.

Figure 4.6.1.3. Disbursements for the 21 days following each natural disaster (US$)



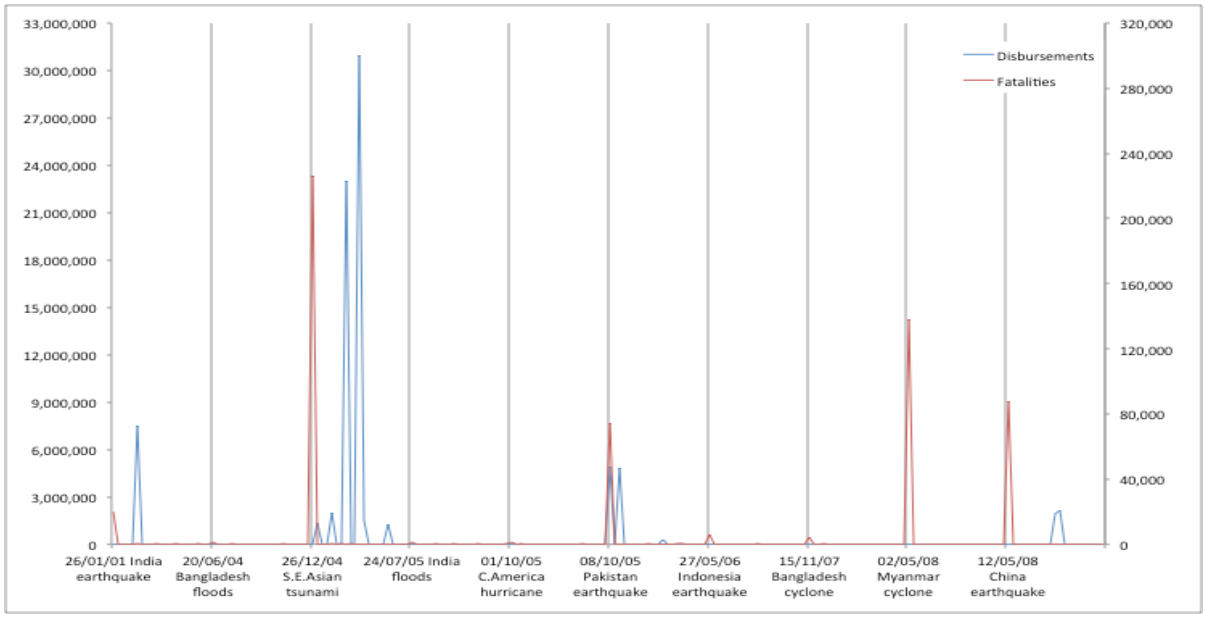

*Source: the author on elaborations from the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA).*

Figure 4.6.1.3 illustrates the emergency financial disbursements provided by the German government to the disaster-stricken countries under investigation for the whole period of analysis. While the number of disbursements is relatively limited, the figure was retained for reasons of coherence and for comparative with the other case studies under investigation.

This graph highlights the German government's uneven distribution of humanitarian aid. While the victims of the South-East Asian tsunami benefitted from German emergency financial assistance to the tune of well over US$ 55,000,000 (in more than one tranche), all other humanitarian catastrophes never managed to secure over US$ 10,000,000 in emergency humanitarian assistance (including multiple disbursements for the same humanitarian catastrophe). As much as Germany displayed great generosity following the December 2004 tsunami, little generosity was displayed in the years preceding or following that catastrophe. While the second most well funded humanitarian emergency (the Kashmir earthquake) received US$ 10,000,000 in emergency aid (in two tranches) and the third best-funded (the Gujarat earthquake of January 2001) received US$ 7,500,000, all other catastrophes never managed to attract funding for over US$ 2,000,000. Five out of the ten natural disasters under investigation (including the almost 140,000 victims of cyclone Nargis in May 2008) received no financial assistance from the German government. The emergency aid provided by the German government to countries struck by natural disasters seems to be forthcoming only in

very few circumstances and in relatively limited amounts: the aid provided following the December 2004 tsunami seems even more exceptional once placed within the broader context of the amounts of financial assistance that Germany has provided within the whole period of analysis, both highlighting the generosity of the days following December 26th, 2004 and potentially putting to shame the behaviour of the federal government ever since.

Figure 4.6.1.4. Disbursements and fatalities for the 21 days following a disaster (US$)




*Source: Elaborations of the author on data provided by the International Emergency Events Database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain (UCL) and the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (OCHA).*

Figure 4.6.1.4 highlights the disbursements of emergency financial assistance provided by the German federal government against the number of fatalities recorded for the natural disasters under investigation for the whole period of analysis.

Looking at the graph, a number of observations can be made. Firstly, the amount of financial assistance provided seems to be linked to the number of fatalities reported for a natural catastrophe. While such finding is confirmed by the multiple regression analysis, some qualifications are still needed. As the graph clearly highlights in the case of the December 2004 tsunami, the Gujarat earthquake of January 2001 and the Kashmir earthquake of October 2005, greater numbers of fatalities are followed by greater disbursements. However, such pattern is not so clear if one focuses on the cyclone that struck Myanmar on the 2nd of May 2008 and the Sichuan (China) earthquake of the 12th of May 2008. While disbursements for

these two last natural disasters were either nil or very limited, disaster-specific explanations might account for this lack or limited amount of financial assistance. Indeed, in the case of the Myanmar cyclone, the extremely complicated diplomatic situation involving the country's military junta might have encouraged the German government from refraining to provide immediate humanitarian assistance. In the case of the Sichuan earthquake, the fact that China is increasingly seen as a relatively wealthy and developed country might have accounted for the German government's decision to provide the country with only very limited humanitarian aid. A second observation that can be made by looking at the graph relates to the timing of the provision of financial assistance: with the sole exception of the Sichuan earthquake (China) in May 2008, it appears as if emergency financial assistance on behalf of the German federal government either is provided almost immediately following a natural catastrophe or not all. Finally, a last observation shall be made in relation to the "pull factor" that the number of fatalities recorded in a natural disaster might or might not have in determining the disbursement of emergency financial assistance on behalf of the German federal government. Indeed, while only natural disasters that recorded more than 20,000 fatalities seem to be receiving any amount of emergency financial assistance, it should be noted that the denial of financial assistance seem to be absolutely not correlated with the total number of fatalities recorded: both relatively "minor" crises such as the Bangladeshi floods of June 2004, the Java earthquake in May 2005, the Indian floods of July 2005, Hurricane Stan in October 2005 or cyclone Sidr in November 2007 as well as "major crises" in terms of fatalities such as cyclone Nargis in May 2008 might completely fail to encourage the German federal government to provide any emergency financial assistance. Having made the above-mentioned observations of the quantitative analysis obtained through statistical methods as shown through the GLS regression and the graphs that have followed, our investigation has to be complemented by a qualitative analysis capable of accounting for some of the patterns and trends that have been highlighted so far.

### 4.6.2. Data analysis for the "humanitarian mechanism" hypothesis

While the previous chapter quantitatively dealt with the first two hypotheses under investigation, this chapter investigates the "humanitarian mechanism" explanation by qualitatively exploring the four independent variables selected for it.

1. Internationalisation

The German humanitarian system seems remarkably well integrated within the broader international humanitarian system and Germany plays a pro-active role within it. A brief analysis of the initiatives that Germany has subscribed to over the years provides ample evidence of the country's long-standing commitment to cooperate with the international community in order to provide assistance to less economically developed countries.

To begin with, it shall be noted that Germany has been a founding member of the Development Assistance Committee (DAC) of the Organisation for Economic Cooperation and Development (OECD) since its inception in 1961. This early commitment to the OECD's committee dedicated to the provision of development and humanitarian assistance is a first indicator of the fact that Germany is no newcomer to the international donor community. Within this context, Germany's long-standing commitment to humanitarian practice has been renewed at the beginning of the 20th century through Berlin's participation in a number of new initiatives. Indeed, while in 2003 Germany joined the Good Humanitarian Donorship (GHD) initiative, in 2005 it also adhered to the Paris Declaration on Aid Effectiveness and in 2008 it moved on to subscribe to the Accra Agenda for Action (AAA). Finally, while unlike some of its European peers Germany has not yet ratified and published the relevant data, Berlin has signed up to the International Aid Transparency Initiative (IATI) on aid accountability and transparent reporting (GHA 2011). The evidence therefore suggests that, unlike countries such as Spain and Italy, Germany has for a long time been and still is a donor country fully and actively integrated within the international humanitarian community.

2. Financial commitment

Germany's financial commitment to humanitarian and development aid policies is rather modest. While being one of the single largest providers of both humanitarian and development assistance worldwide in absolute terms, in relative terms Germany dedicates rather limited resources to the provision of humanitarian and development assistance.

A look at the data provided by the United Nations' statistical department highlights the unspectacular performance posted by Germany in terms of development aid provision. While in the period between the 1st of January 2000 and the 31st of December 2008 Berlin dedicated an average of 0.31% of its Gross National Income (GNI) to the provision of Overseas Development Assistance (ODA), throughout the same period, the average percentage of GNI dedicated to ODA by all the seven donor countries under investigation was a much higher

0.46% (UNData 2011). Germany's below average performance can also be observed when one focuses on humanitarian aid rather than long-term development assistance. Indeed, while the percentage of German humanitarian aid out of the total of Germany's ODA has risen from a low of 2% in 2004 to 3.3% in 2008, Germany still lags far behind the DAC donors' average of 9.2% for 2008 (OECD 2010). Furthermore, it shall be pointed out that Germany's uninspiring performance in terms of its commitment to the provision of humanitarian assistance was further confirmed by the findings of this dissertation. While countries such as Denmark, the Netherlands and the United Kingdom dedicated 0.0020%, 0.0007% and 0.0007% of their respective GNIs to the provision of emergency humanitarian assistance to the victims of the ten natural disasters under investigation, Germany managed to provide assistance only to the tune of 0.0005% of its GNI.

Shifting one's analysis to a more historical perspective, a number of observations can also be made. To begin with, Germany's total Overseas Development Assistance (ODA) throughout the 1995 to 2005 period constantly hovered around US$ 7.5 billion. It then rather suddenly started to significantly increase under the leadership of Chancellor Merkel whereby the CDU-SPD Grand Coalition oversaw a constant increase in ODA expenditure from US$ 7.9 billion in 2005 to US$ 12.3 billion in 2009. Following a similar pattern, German humanitarian aid has also experienced a significant increase from 2005 onwards. Indeed, at the time of the South East Asian tsunami (between 2004 and 2005), German humanitarian assistance shoot up from US$ 571 million in 2004 to US$ 839 million in 2005 and it has since then hovered between US$ 839 million in 2005 and US$ 738 million in 2009. Having said that, it should be noted that German humanitarian aid as a percentage of total Overseas Development Assistance (ODA) has actually decreased over the period of analysis taken into account by this dissertation (GHA 2011).

3. Operational independence

Germany's humanitarian department within the Foreign Ministry seems to be able to enjoy a substantial degree of operational independence in deciding when, where and how to provide emergency humanitarian assistance to disaster-stricken countries worldwide. A number of observations provide clues in this respect.

To begin with, a peculiarity of the German humanitarian system rests with the fact that it is the German Foreign Office that directly manages humanitarian aid provided by the German government to disaster-stricken populations worldwide. This is due to a long-term strategic

decision dating back to the 1970s to keep humanitarian and development aid as separate policies under the responsibility of separate government agencies. This *modus operandi* persisted both through the exponential growth in the number of humanitarian crises of the 1970s and 1980s as well as the re-organisation of Germany's foreign policy and the country's enhanced role on the world stage following the fall of the Berlin Wall. This peculiarity clearly distinguishes the organisational culture of German humanitarian and development aid institutions from the structures of many of its European counterparts where, as a rule, humanitarian and development aid are managed by the same executive body. Such an arrangement is key in keeping the provision of short-term emergency humanitarian assistance separated and independent from long-term development assistance more likely to be the subject of undue geostrategic and foreign policy objectives.

Secondly, the provision of humanitarian aid on behalf of the German Foreign Ministry has to follow a strict "hierarchy of needs" whereby priority is given to the provision of potable water and food, followed by the provision of medical care to meet the immediate needs of the affected populations and, finally, the provision of security and protection for the recipient populations both from the elements of nature and from eventual violent attacks (Eberwein, 2002). The fact that the humanitarian department of the German Foreign Ministry has to stick to such a strict "hierarchy of needs" further contributes to make it more likely for humanitarian aid to be delivered according to strict humanitarian criteria as opposed to more subjective ones that could be superseded by foreign policy considerations.

Thirdly and in terms of the destination of its humanitarian aid, Germany displays a significant degree of predictability for what concerns both the recipient countries it decides to support and the funding channels that it chooses to use in order to do so. Looking at the recipients, there exists a significant degree of predictability for what concerns the countries most likely to receive German humanitarian aid. Indeed, Sudan, Afghanistan and the Occupied Palestinian Territories have always been among the top five recipients of German humanitarian assistance throughout the 2003 to 2008 period (GHA 2011). Stability and predictability in terms of recipient countries would seem therefore to suggest that the provision of German humanitarian assistance is not subject to follow foreign policy interests and geostrategic considerations.

Moving on to the actual channels through which German's assistance is delivered, it immediately becomes clear that most of the country's humanitarian aid is overwhelmingly channelled through multilateral channels in general and the European Commission's

Humanitarian Office (ECHO) in particular. Indeed, in 2009 alone, Germany channelled US$ 336,500,000 million in humanitarian aid to the European Commission making it by far its largest first-tier recipient of aid. Germany's support for the European Commission has been consistent over the years with a percentage between 46% and 57% of all German humanitarian aid between 2005 and 2009 being channelled through the European Commission. A pattern, this one, that has been further strengthened by the fact that between the same years, Germany contributed always over 20% of the European Commission's total Overseas Development assistance (ODA). Still in the year 2009 but far behind the European Commission, the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), the World Food Programme (WFP) and the KfW banking group were awarded US$ 66,500,000, US$ 58,100,000 and US$ 54,200,000 in financing respectively. OCHA, UNHCR and UNRWA ranked fifth, sixth and seventh place as first-tier recipients with donations of US$ 21.4 million, US$ 17.6 million and US$ 11.4 million each. Last but not least, the World Bank, the ICRC and the Federal Ministry for Development Cooperation (BMZ) were the last three top-tier recipients of German humanitarian aid with donations of US$ 8.6 million, US$ 5.7 million and US$ 4.9 million in 2009 (GHA 2011). The fact that German humanitarian assistance is overwhelmingly provided through multilateral channels seems to suggest once more that Germany's humanitarian department can count on a significant degree of operational independence vis-à-vis the country's foreign policy's objectives. Indeed, had the German Foreign Ministry wished to make use of humanitarian assistance as a "foreign policy lubricant", bilateral channels would have been a much preferred option.

4. Administrative capacity

The administrative capacity of Germany's humanitarian agency has for a long time been weakened by a series of institutional and structural shortcomings of the broader German humanitarian system. As a number of observations highlight, the situation is nevertheless in tremendous flux and Germany is working hard to address these challenges.

To begin with and on a positive note, the German Foreign Office can count on a dedicated "Department of the United Nations, Human Rights and Humanitarian Aid" with exclusive competence and responsibility for the coordination of emergency relief operations and the provision of humanitarian aid. Headed by the Commissioner for Human Rights Policy and Humanitarian Aid (currently Mr. Markus Löning) and with a staff of over 20 full-time employees dedicated solely to humanitarian aid issues, it is this specific department that effectively sets the humanitarian aid agenda for the foreign ministry itself.

While Germany can count on the work of a dedicated humanitarian unit within its foreign ministry, the provision of German humanitarian aid has for a long time suffered from the lack of coordination that resulted from having a variety of institutions engaging in the provision of humanitarian assistance at the same time. Indeed, German humanitarian assistance has traditionally been extremely fragmented between a number of agencies such as the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), InWent, the Deutscher Entwicklungsdienst (DED), the Kreditanstalt für Wiederaufbau (DfW) and the Bundesanstalt Technisches Hilfswerk (THW) as well as the Ministry of Foreign Affairs (AA) and the German development Ministry (BMZ). Such fragmentation has been significantly reduced as from January 1st 2011 with the creation of the Gesellschaft für Internationale Zusammenarbeit (GIZ) that resulted from the merger of GTZ, DED and InWent. Nevertheless, the significant degree of fragmentation experienced over many years has for a long time made it particularly challenging to coordinate the simultaneous provision of emergency financial assistance from all the national bodies involved in humanitarian policy.

Within this context, challenges to the effective provision of humanitarian assistance have been experienced for a long time and despite the fact that a relevant forum had been put in place in order to address them. German humanitarian aid is strategically overseen by the Humanitarian Aid Coordinating Committee: a body comprising representatives from the Foreign Office itself, other ministries such as the Federal Ministry for Economic Cooperation and Development (BMZ) and representatives of German aid organisations. The fact that all aid and governmental organisations involved in the German Humanitarian Aid Coordinating Committee managed to agree to the "twelve basic rules of humanitarian assistance abroad" on the 17th of June 1993 was an important moment in the establishment of a stronger partnership between stakeholders of the German humanitarian that nevertheless did not address the high degree of fragmentation described above. It is now hoped that, following the establishment of GIZ in 2011, administrative practices will be streamlined to the benefit of all relevant stakeholders.

Last but not least, the Department of the United Nations, Human Rights and Humanitarian Aid within the German Foreign Ministry can count on significant and slowly but constantly increasing financial resources that enable it to retain an adequate administrative capacity. Indeed, throughout the period of analysis, resources available to the department for expenditure directly aimed at the provision of humanitarian assistance have risen from a low of US$ 516,900,000 in 2000 to US$ 743,100,000 in 2008. Such a positive development

should in principle have made it easier for the department to enhance its administrative capacity.

### 4.6.3. Summary of the major findings for Germany

As observed in the case of all donor countries combined, the Federal Republic of Germany subscribes to the hypothesis according to which the magnitude of a natural disaster has a significant impact on the extent to which donor governments are prepared to disburse emergency humanitarian assistance to countries struck by a sudden natural disaster. More interestingly, however, the findings obtained for Germany corroborate both those recorded for the British and Dutch case studies as well as for the Spanish one.

More specifically for what concerns the "magnitude of the natural disaster hypothesis", both the independent variable pertaining to the number of fatalities recorded for a natural disaster under investigation as well as the number of days that have elapsed since the onset of a disaster are highly significant in encouraging the provision of emergency humanitarian assistance on behalf of the German government. Indeed, these findings are in line with those obtained through the multiple regression analysis for all donor countries combined, with those obtained for the United Kingdom and the Netherlands with respect to the variable pertaining to the number of fatalities reported and with those recorded for Spain for what concerns the number of days that have elapsed since the onset of a natural disaster.

Having said that, unlike in the case of the research hypothesis presented above, the results obtained for the hypothesis according to which the domestic politics of a donor country are significant in affecting the extent to which its government is ready to provide emergency humanitarian assistance to countries struck by a sudden natural disaster do not seem to be able to confirm the hypothesis. Indeed, none of the four independent variables analysed to investigate such a hypothesis seem able to account for variation in the dependent variable.

Within this context, a qualitative analysis of the *modus operandi* of the German humanitarian agency carried out in order to investigate the hypothesis according to which this might influence the provision of humanitarian assistance on behalf of a national government, seem to go some way towards confirming the hypothesis. Indeed, for all independent variables examined (the humanitarian agency's administrative capacity, its degree of internationalization, its degree of independence from undue political pressure and the country's general financial commitment to the provision of ODA), Germany records above-average results vis-à-vis the other donor countries under investigation.

### 4.7. France

The seventh part of the chapter dealing with the data analysis provides the results obtained for France. This part of the chapter is therefore once more made up by three sections: a first one which focuses on the quantitative analysis of the "domestic politics" and "disaster magnitude" hypotheses, a second one which concentrates on the qualitative investigation of the "humanitarian mechanism" hypothesis and a third one providing a summary of the major findings.

#### 4.7.1. Data analysis for the "domestic politics" and "disaster magnitude" hypotheses

Figure 4.7.1.1. Multiple regression analysis for all the independent variables

Number of observations=210
Time periods=10

| log_disburse | Coef. | Std. Err. | P>\|z\| |
|---|---|---|---|
| gdpus | -1.505 | 0.478 | 0.002* |
| catastroph~y | -0.052 | 0.046 | 0.257 |
| clgovernment | -0.114 | 0.062 | 0.067 |
| election | (omitted) | | |
| fatalities | 0.178 | 0.064 | 0.006* |
| affected | -0.098 | 0.060 | 0.101 |
| damage | 0.165 | 0.070 | 0.018* |
| totarticles | 0.002 | 0.137 | 0.987 |
| _cons | 1.051 | 0.330 | 0.001 |

*Key:*

*log_disburse: Logarithmic disbursement (dependent variable)*

*gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation*

*catastroph˜y: Catastrophe day (days elapsed since the onset of a selected natural disaster)*

*clgovernment: Centre-left government (presence or not of centre-left parties in government)*

*election: Election (presence or not of electoral period in the donor country)*

*fatalities: Fatalities (number of fatalities recorded for natural disaster under investigation)*

*affected: Affected (number of people affected by the natural disaster under investigation)*

*damage: Damage (estimated damages recorded for the natural disaster under investigation)*

*totarticles: Total articles (total articles recorded on the natural disaster under investigation*

*_cons: Constant*

*Source: the author.*

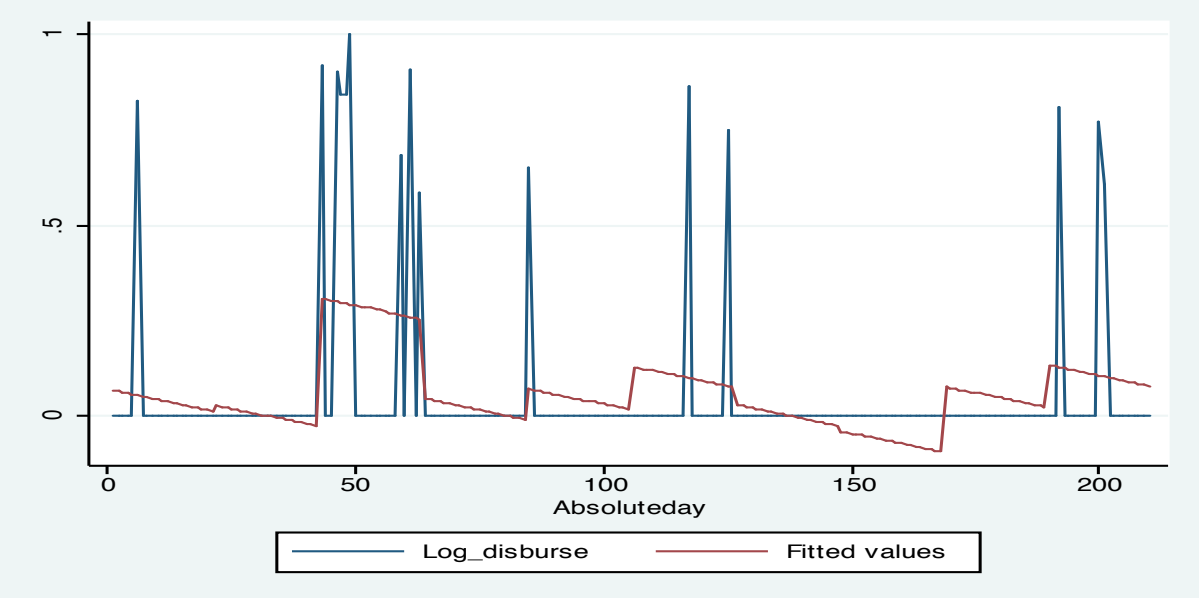
Figure 4.7.1.1 illustrates the results obtained through the Multiple Regression Analysis (MRA) with Generalised Least Squares (GLS) for France in the ten natural disasters under investigation.

In figure 4.7.1.1, one can observe P > z values of almost 0.000, the variables relating to the donor country's GDP and the number of fatalities recorded and a P > z value of 0.018 for the estimated damages for the ten natural disasters under investigation. The data therefore suggest that there is a 99% to (almost) 100% probability that these three investigated independent variables have an effect on the dependent variable. Likewise, the data suggest that there is less than 1% likelihood that the obtained values are the result of random distribution. Aside from the P > z values, the coefficients with the highest absolute values are also those ones pertaining to the donor country's GDP, to the total number of fatalities recorded and to the estimated damages for the natural catastrophes under investigation (-1.505, 0.178 and 0.165 respectively) The most significant independent variables that account for disbursements of emergency humanitarian assistance in the case of France are therefore those represented by the donor country's GDP, the total number of fatalities recorded and the estimated damages sustained due to a natural disaster. Having said that and as it has been the case for the regressions run for all donor countries combined and for the Netherlands, the negative coefficient and the extremely high standard error recorded for the variable accounting for France's gross domestic product (0.478) should invite caution when assessing the variable itself. Following the multiple regression analysis, possible multicollinearity problems between the investigated variables are checked by computing for the tolerance value by regressing one of the explanatory variables on all other explanatory variables. The relevant diagnostics run for the regression find no multicollinearity between the investigated variables.

The data collected through the multiple regression analysis for the French case study allow us to make three final considerations. To begin with, the hypothesis according to which the magnitude of a natural disaster is a significant factor accounting for disbursements of humanitarian assistance on behalf of the French government is confirmed. Indeed, both the

variable pertaining to the number of fatalities recorded as well as the one pertaining to the estimated damages recorded following the onset of a sudden natural disaster are significant in accounting for variation in the levels of disbursement. Secondly, the hypothesis according to which French domestic politics might influence the extent to which the French humanitarian agency might be ready to provide emergency humanitarian assistance to countries struck by a sudden natural disaster should be discarded. Indeed, this shall be the case due the fact that three out of four variables selected to operationalize such hypothesis are not significant. Finally, even if one of these four variables is seen to be significant (the one pertaining to the country's gross domestic product), there exist a number of factors that should invite great caution in taking the results obtained for this variable at face value.

Figure 4.7.1.2. Comparison of the observed and the predicted values of the disbursements



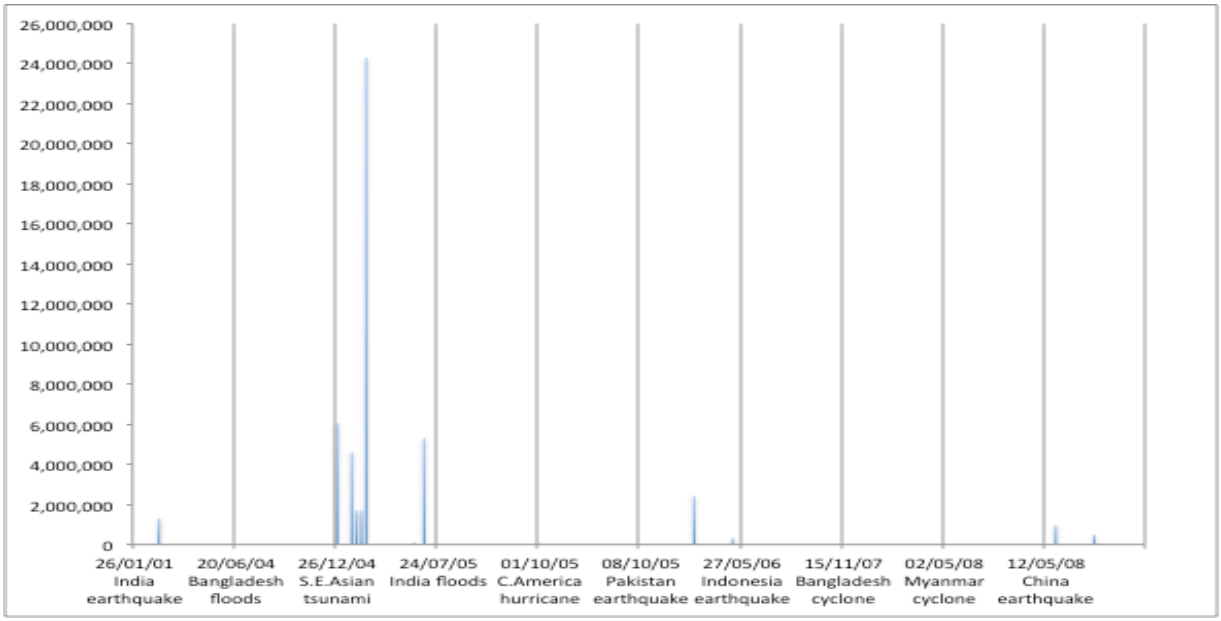

*Source: the author.*

Figure 4.7.1.2 presents the logarithm of the disbursement value and its estimated values for the twenty-one "crises days" that have been analysed following each of the ten natural disasters under investigation.

Figure 4.7.1.2 compares the predicted values of the disbursements aganst the actual recorded values. The graph therefore provides the opportunity to investigate the performance of the predictive model across the whole period of analysis Observing the graph, two observations can be made: to begin with, the model, by predicting only the sections around absolute day fifty, eighty and two hundred, clearly struggles to account for variation of the dependent variable. Secondly, the model could potentially improve with the inclusion of further

variables. Having said that, the model rpredicts in a relatively accurate manner those disbursemnst that took place on the occasion of the South-East Asian tsunami of the 26th of January 2004 and for the Sichuan earthquake of the 12th of May 2008.

Figure 4.7.1.3. Disbursements for the 21 days following each natural disaster (US$)




*Source: the author on elaborations from the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA).*

Figure 4.7.1.3 illustrates the disbursements of emergency financial assistance provided by the French government to the victims of the ten natural disasters under investigation as recorded through the United Nations Office for the Coordination of Humanitarian Affairs' Financial Tracking System. While only a few disbursements are recorded for the whole period of analysis, it was decided to still include this graph for comparative purposes in relation to the other case studies under investigation.

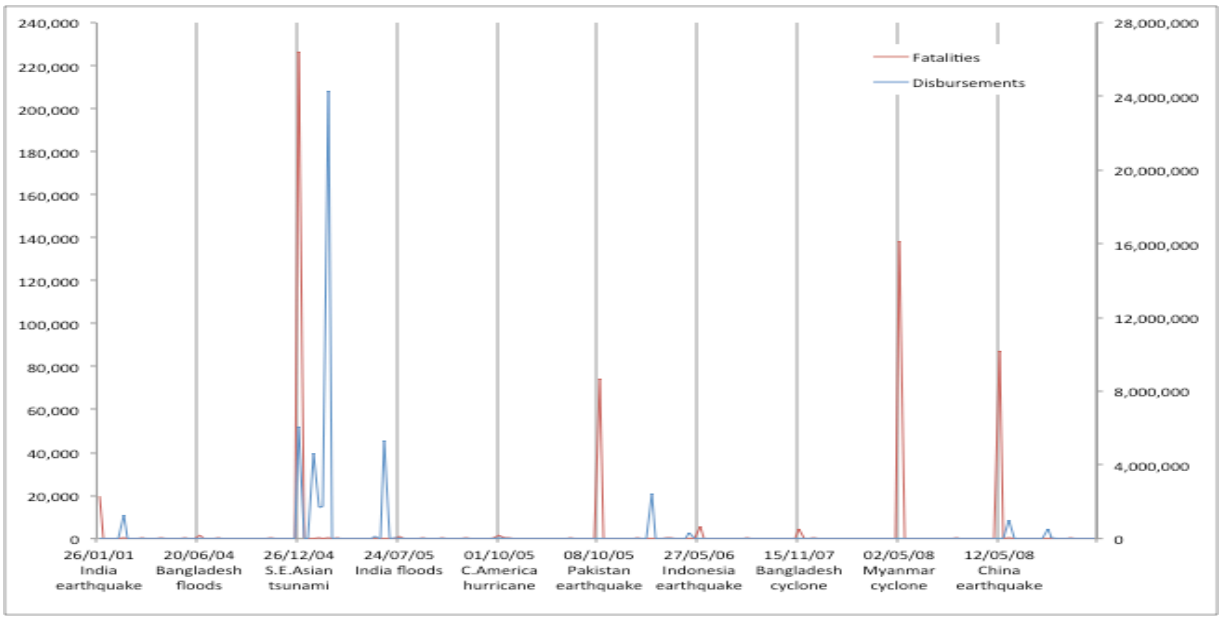
By looking at the graph, it immediately appears clear the imbalance between the amount of financial emergency assistance provided by the French government on the occasion of the South East Asian tsunami of December 26th, 2004 and all the other natural disasters under investigation in the January 1st 2000 to December 31st 2008 period. Not only did the victims of the 2004 tsunami received by far the single largest donation from the French government within the whole period of analysis (over US$ 24,000,000), they also received some three other donations to the tune of over US$ 6,000,000, US$ 4,000,000 and US$ 5,000,000 and an additional four smaller donations throughout the three weeks following the onset of the

emergency. The total amount of financial emergency assistance received by the victims of the tsunami from the French government was therefore to the tune of US$ 43,852,400. This amount stands in sharp contrast with the disbursements made by the French government on all other occasions.

On the occasion of the earthquake that struck Pakistani-controlled Kashmir on the 8th of October 2005, the French government made the largest disbursement for any catastrophe other than the December 2004 tsunami: just over US$ 2,421,308. This amount, coupled to a later donation of US$ 342,548 brought the total amount of emergency financial assistance offered to the victims of the Pakistani earthquake to US$ 2,763,856. The natural disaster that received the second largest amount of emergency financial assistance after the December 2004 tsunami received therefore just over 5% of the total received by the victims of the tsunami itself.

The catastrophe that received the third largest amount of disbursements was the Gujarat earthquake of January 26th, 2001: the victims of the quake received a one off donation of US$ 1,297,921 while the fourth catastrophe in terms of assistance received was the Sichuan earthquake of May 12th, 2008. On this occasion, the French government released three payments of US$ 973,988, US$ 492,236 and US$ 31,153 for a total of US$ 1,497,377. Finally, the French government provided the symbolic sum of US$ 66,106 in emergency financial assistance to the victims of hurricane Stan in October 2005. Five out of the ten humanitarian catastrophes under investigation (Bangladesh floods of June 2004, Indian floods of July 2005, Java earthquake of May 2006, cyclone Sidr in November 2007 and cyclone Nargis in May 2008) received no aid whatsoever from the French government as recorded through OCHA's Financial Tracking System.

Figure 4.7.1.4. Fatalities and disbursements for the 21 days following a disaster (US$)




*Source: Elaborations of the author on data provided by the International Emergency Events Database (EM-DAT) of the Centre for the Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain and the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (OCHA).*

Figure 4.7.1.4 illustrates the relationship between the total number of fatalities recorded and the disbursements provided by the French government for each of the ten selected humanitarian crises for the 1st of January 2000 to December 31st 2008 period of analysis.

As it can be immediately observed, the South-East Asian tsunami of December 2004 is by far the humanitarian crises that triggered the provision of most humanitarian assistance on behalf of the French government. Aside from the actual amounts, what is particularly interesting to observe is that the overwhelming majority of funding was released within a week of the onset of the crises and that only a minimal amount (with a peak of US$ 5,305,040) was disbursed towards the end of the three-weeks period of analysis following each humanitarian catastrophe under investigation.

Although on an exceptionally smaller scale, such a quick response in terms of the provision of humanitarian assistance can also be observed following the Gujarat earthquake of the 26th of January 2001 and the Sichuan earthquake of the 12th of May 2008: in both these instances, the provision of emergency financial assistance came about well within one week of the onset of each crises. Unlike in the case of the emergencies mentioned above, in the case of the

Kashmir earthquake of the 8th of October 2005, financial assistance was provided well two and three weeks into the crises.

A number of other crises received either no or only symbolic financial assistance from the French government. This was clearly the case for the Bangladesh floods of June 2004, the Indian floods of July 2005, hurricane Stan in October 2005, the Java earthquake of of the 27th of May 2006 and cyclone Sidr in November 2007. One final general consideration can be made by looking at the graph illustrating the relationship between the total number of recorded fatalities and the disbursements of emergency financial assistance of behalf of the French government: the total amount of humanitarian assistance does not seem to be related to the total number of fatalities. Indeed, this situation is clearly illustrated by the fact that natural disasters such as the Kashmir earthquake (74,659 fatalities), cyclone Nargis (138,434 fatalities) and the Sichuan earthquake (87,476 fatalities) did not receive financial assistance in proportional terms relative to the number of fatalities recorded.

### 4.7.2. Data analysis for the "humanitarian mechanism" hypothesis

While the previous chapter quantitatively dealt with the first two hypotheses under investigation, this chapter investigates the "humanitarian mechanism" explanation by qualitatively exploring the four independent variables selected for it.

1. Internationalisation

France is a long-term and substantial contributor to the international humanitarian community. The country played and still plays a significant role on the international stage and it has been the promoter of a number of multilateral initiatives both past and present. It has, however, so far failed to sign up to the latest initiatives launched by the international community to promote greater accountability and transparency in terms of financial disbursements.

A number of indicators seem to contribute to paint a picture that sees France as having been for many decades a key actor on the humanitarian stage. To begin with, France together with a number of other West European governments and the United States was instrumental in establishing the OECD's Development Assistance Committee (DAC) in 1961. More recently, in February 2005 France hosted and organised with the OECD the Paris High Level Forum on Aid Effectiveness. The proceedings of such meeting led to over one hundred parties to sign the Paris Declaration on Aid Effectiveness and to set new and much higher standards for the

international community in terms of development aid provision. Following up on the commitments taken in Paris, France was, together with the United Kingdom, instrumental in pushing forward and adopting together with the international community the Accra Agenda for Action (AAA) in September 2008. However, despite the fact that it was launched at the same time as the Accra Agenda for Action, France has so far failed to sign up to the International Aid Transparency Initiative (IATI) to promote greater accountability in humanitarian and developmental expenditures worldwide (GHA 2011).

2. Financial commitment

French financial commitment to the provision of both humanitarian and development aid is mediocre with the country's performance falling near the average performance recorded by all seven donor countries under investigation. Furthermore and when looked at from an historical perspective, Paris' financial commitment to the provision of financial assistance to economically less developed countries seems to be subject to extreme variation over time.

A number of observations suggest that France records a rather average performance when it comes to the provision of both humanitarian and development assistance. To begin with, throughout the period of analysis, France dedicated an average of 0.38% of its Gross National income (GNI) to the provision of Overseas Development Assistance (ODA). This is a percentage clearly below the average of 0.46% recorded by all seven donors under investigation. However, when one excludes the exceptional performance posted by Denmark and, to a lesser extent, the Netherlands, Paris performance is a respectable one on a par with that of the United Kingdom (UNData 2011). The performance described above falls within a broader context whereby the amount of Overseas Development Assistance (understood as long-term development aid plus humanitarian aid and minus debt relief) provided by France in the 1995 to 2008 period, has been going through three separate stages. The phase between 1995 and 1997 included saw the French government providing high volumes of ODA with this ranging between US$ 11.2 billion in 1995 to US$ 10.18 billion in 1997 and through US$ 9.33 billion in 1996. A second stage between 1998 and 2003 saw a significant drop in the amount of overseas development assistance provided. Indeed, between 1998 and 2003, French ODA oscillated between a high of US$ 7.55 billion in 1998 and a low of US$ 5.99 billion in 2003. Finally, in the years from 2004 onward, French ODA increased once more to some more significant (although by no means exceptional) levels. Indeed, between 2004 and 2008 included, French ODA hovered between a low of US$ 7.94 billion recorded in 2005 and a high of US$ 9.59 billion recorded in 2008 at 2009 constant prices (GHA 2011).

Still from an historical perspective, French expenditure for humanitarian aid remained remarkably low in the 1995 to 2000 period, it saw a spectacular increase in the 2001 to 2005 period and it then returned to more modest levels from 2006 onward. Indeed, between 1995 and 2000 and with the exception of 1999 that saw significantly higher expenditures, the French government always disbursed between US$ 196.07 million (in 1996) and US$ 237.39 million (in 2000) per year for humanitarian assistance. The years between 2001 and 2005 saw a new phase whereby the French government continuously increased to ever more significant levels the amount of humanitarian aid willing to provide to recipient countries. Indeed, throughout these years, humanitarian aid expenditure continuously increased from the US$ 237.39 million of 2000 to the US$ 1160.75 million of 2005. Finally and following such a marked increase over the second half of the first decade of the 21st century, French humanitarian aid decreased once more and settled to some more modest and almost identical levels: US$ 448.85 million in 2006, US$ 434.26 million in 2007 and US$ 422.96 million in 2008 (GHA 2011). As result of what has been highlighted above, it can be claimed that French financial commitment to the provision of both humanitarian and development assistance is characterised by an average performance coupled with "historical swings" that alternate a number of years of increased commitment with others where disbursements are significantly more limited.

3. Operational independence

French humanitarian and development assistance seems to be delivered under strict political supervision. As result of this, a number of characteristics of the French humanitarian system suggest the presence of a state of affairs whereby aid might often be provided according to foreign policy considerations rather than humanitarian ones.

To begin with, the fact that the French political establishment can exercise direct control over many aspects of both development and humanitarian aid policies does not bode well for the French humanitarian agency's ability to take decisions free of undue political pressure. While Mr. Henri de Raincourt is the Minister responsible for development cooperation, the Directorate General for Global Affairs, Development and Partnerships (DG GAPD) is the structure tasked with managing French humanitarian and development aid from within the French Foreign Ministry. DG GADP consists of two delegations (External Action of Local Authorities and Relations with Civil Society) and five directorates: Global economy and development strategies; Global public goods; Culture and French language policy; Mobility and attractiveness policy and, finally, Finance and network coordination. Each directorate is,

in turn, made up by a number of specialised units. While political leadership for French humanitarian and development aid policies rests with the Directorate General for Global Affairs, Development and Partnerships (DG GADP), most of France's developmental commitments are carried out through the work carried out by the Agence Française de Développement (AFD), which DG GADP supervises both politically and operationally.

Established with a governmental decree on the 30th of October 1992, the Agence Française de Développement (AFD) is the development finance institution of the French government (AFD 2007; 2011). The AFD is a specialised financial institution operating under the aegis of the French Ministry of Finances, the French Ministry for Overseas Territories and the French Ministry of Foreign Affairs. Structured both as a specialised financial institution and as a development bank, AFD runs a network of 61 agencies and offices around worldwide tasked with the implementation of France's overseas development Assistance. Within this context, AFD is under the political supervision of a Board of Directors made up by a Chairperson and by 16 individuals. Six board members are state representatives from the three above-mentioned government ministries. Five board members are individuals appointed in light of their professional expertise. Three board members are selected by the French parliament. Finally, two board members are appointed by the AFD Union of Employees. Therefore, as its has been highlighted, the AFD clearly operates under strict political control.

In line with the findings presented above, an investigation of the key recipients of humanitarian aid suggests that France is still too frequently tempted to disburse emergency humanitarian assistance according to parameters which are not only strictly humanitarian ones. When looking at the top-ten recipients of French humanitarian assistance for the last year under investigation (2008) one can observe the presence of various countries that are not surprisingly also the top recipients of humanitarian aid from other European member states. The Occupied Palestinian Territories, Sudan, Afghanistan, Somalia, Sri Lanka and Jordan fall into this category. However and more surprisingly, among the top-ten recipients of French humanitarian aid one can also find countries such as Lebanon, Haiti, the Democratic Republic of Congo and Ivory Coast. More specifically, a look at the top recipients of French humanitarian assistance for the year 2008 provides a good glimpse of some long-term and established patterns. The top-ten recipients of French humanitarian aid in 2008 were the Palestinian Administered Territories with US$ 56.54 million (equal to 15% of total disbursements), Sudan with US$ 38.42 million (10% of the total), Afghanistan with US$ 36.54 million (10%), Somalia with US$ 18.51 million (5%), Lebanon with US$ 16.23 million

(5%), Sri Lanka with US$ 13.67 million (4%), Haiti with US$ 12.56 million (3%), Jordan with US$ 12.38 million (3%), DR Congo with US$ 12.17 million (3%) and, finally, Ivory Coast with US$ 11.85 million (3% of the total) (GHA 2011). A number of countries that are either former French colonies or entertain close economic, historical, linguistic and cultural ties with France seem therefore to be entitled to receive significant amounts of humanitarian assistance despite not necessarily finding themselves in the dire circumstances one would expect them to be in order to qualify for French humanitarian aid. While highly disturbing, such use of humanitarian assistance as a "foreign policy lubricant" should not come as a surprise. Based within the French Foreign Ministry, DG GAPD is tasked with the management of French humanitarian and development assistance through the Agence Française de Développement. In turn, the AFD operates under the aegis of a triumvirate made up by the French Ministry of Finances, the French Ministry for Overseas Territories and the French Ministry of Foreign Affairs. It is therefore not surprising that the compromises needed to reach an agreement between the three ministries on which potential recipients might be worthy of French humanitarian assistance should promote a state of affairs whereby geopolitical considerations might too often take precedence over more strictly humanitarian ones.

Finally and in terms of the channels through which the French government provides humanitarian aid to recipient countries, interesting patterns can be observed for both UN agencies and the European Union: the two key first-tier recipients of French humanitarian assistance. For what concerns funding of humanitarian assistance through the three "primary humanitarian agencies" (UNHCR, UNWRA and WFP), one can observe the presence of two very distinct periods. On the one hand, in the decade from 1995 to 2005, the French government provided a fundamentally stable amount of financing to UN agencies. Indeed, this is highlighted by the fact that, while French humanitarian assistance channelled through UN agencies in 1995 was of a magnitude of US$ 15.5 million, in 2005 this was of a similar magnitude of US$ 13.9 million. While the years immediately before and after the turn of the century had seen a modest increase in the amounts provided (for instance, US$ 24.5 million in 2000), this temporary increase was not sustained and does not alter the overall picture provided by the 1995 to 2005 period. On the other hand, the years from 2006 onwards saw a significant increase in the amount of humanitarian assistance channelled through UN multilateral institutions. Indeed, the contrast is sharp when one observes that, against the US$ 13.9 million provided in 2005, the French government channelled US$ 37.3 million, US$ 43.8 million and US$ 44.9 million in 2006, 2007 and 2008 respectively. Of an entirely different

magnitude is the amount of humanitarian assistance that the French government channels to recipient countries through the European Commission. Here as well, a specific pattern for the 1995 to 2004 period and another one for the years from 2005 onward can be observed, just on an altogether grander scale. In the 1995 to 2004 period, the French government channelled always a remarkably similar amount of humanitarian assistance through the European Commission: one that oscillated little between a low of US$ 180.16 in 1996 and a high of US$ 236.09 million in 1995 (with the significant an much lower exception of US$ 112.10 million in 1998). From 2005 onward, however, the French government seems to be willing to channel significantly higher amounts of its humanitarian assistance through the European Commission. Indeed, between 2004 and 2008, the amount channelled through the commission increases significantly, ranging from a low of US$ 280.81 million in 2004 to a maximum of US$ 382.42 million in 2005 (GHA 2011). Most of the humanitarian assistance that France channels through multilateral organisations is devoted to the financing of the European Commission Humanitarian Office (ECHO) rather than of United Nations' agencies.

4. Administrative capacity

The French humanitarian mechanism is favourably affected by the substantial administrative capacity enjoyed by the Ministry of Foreign Affairs' Delegation for Humanitarian Action (DAH). This relies on a tightly controlled, relatively well-funded and significantly centralised administrative structure in order to effectively perform its tasks in cooperation with partner Non-Governmental Organisations (NGOs).

The overall coordination and provision of French humanitarian assistance can count upon the specialized services provided by the Delegation for Humanitarian Action (DAH) and its sub-departments. Established in 2002 within the French Ministry of Foreign and European Affairs, the DAH incorporates the functions that had previously been carried out by the Service de l'Action Humanitaire (SAH) and the intergovernmental Cellule d'Urgence (CELLUR). Under the leadership of M.me Louise Avon (Director General) and M. Serge Casseri (Executive Director) and in order to coordinate and oversee the provision of humanitarian assistance, the Delegation for Humanitarian Action carries out its work through two departments: the "Sub-directorate for political and humanitarian affairs" (DAH/P) and the "Sub-directorate for humanitarian interventions and evaluation" (DAH/I). Both sub-directorates are made up by a number of specialised units and while the former tends to focus on the observation and anticipation of crises situations and the elaboration of French humanitarian policy, the latter tends to focus on the inter-ministerial coordination of French

humanitarian action, the disbursement of the emergency financial instruments and the management of humanitarian stocks (DAH 2011).

Potential fragmentation of the French government's humanitarian mechanism is limited by the fact that the different agencies that contribute to its delivery are all clustered within the Delegation for Humanitarian Action (DAH) and strictly supervised by it. Indeed, three different agencies directly located within the French Ministry of Foreign and European Affairs are tasked with the handling of France's humanitarian aid policy. Firstly, the Crises Centre (CDC) has privileged access to the Humanitarian Emergency Fund and it is tasked with the assessment of and the response to sudden humanitarian emergencies through the financing of both NGOs and, if necessary, direct government interventions. Secondly, the United Nations and International Organisations Department (UNIO) provides financing to the ICRC, the IFRC and the various UN agencies operating in the context of humanitarian assistance. Finally, the Department for Development Policy (DPDEV) is tasked with the provision of food aid in emergency relief operations. While fulfilling different tasks, all these three agencies fall under the supervision of the Delegation for Humanitarian Action (CDC 2011).

Thirdly, the close cooperation that exists between DG GAPD and French Non-Governmental Organisations (NGOs) results in a win-win situation whereby the French Foreign Ministry can offload the burden of the implementation of its humanitarian policies to NGOs while these can count of the financial resources provided by the ministry. Within this context, the Delegation for Humanitarian Action has over the years established a long-term relationship with other key stakeholders of the French humanitarian aid system. Twenty-two Non-Governmental Organisations (NGOs) have been selected and invited to establish a partnership with the French Foreign Ministry and, in many instances, are tasked with the actual delivery of emergency financial assistance provided by the Delegation for Humanitarian Action (CDC 2011).

Finally, the close cooperation that the Delegation for Humanitarian Action entertains with Non-Governmental Organisations (NGOs) is made possible in large measure by the financial resources that have increasingly made been available to the Delegation by DG GAPD. The French Delegation for Humanitarian Action has been endowed with an amount of financial resources that has significantly increased over time. Indeed, such an amount has doubled from approximately US$ 200,000,000 in 2000 to approximately US$ 400,000,000 in 2008 (GHA 2011). At the same time, the newly established Crisis Centre within the French Foreign

Ministry has been endowed with an independent humanitarian emergency fund of approximately US$ 11,400,000 for the year 2008 alone (DAH 2011).

### 4.7.3. Summary of the major findings for France

Once again as it has been the case with both the multiple regression analysis carried out for all donor countries combined as well as with the British, Dutch, Spanish and German case studies, the evidence obtained for the French case study suggests that the hypothesis according to which the magnitude of a natural disaster has a significant impact on the disbursement of emergency humanitarian assistance on behalf of a donor government can be confirmed.

Following up on the above statement it should be observed that, however, in the French case study, such a hypothesis can be confirmed through the positive feedback provided not only by the independent variable pertaining to the number of fatalities recorded following the onset of a natural disaster. In this respect, while still highly significant, such an independent variable is complemented by the one pertaining to the estimated damages recorded following the onset of a natural disaster. Indeed, unlike in the case of all other investigated donor countries, within the French context, estimated damages seem to significantly influence the degree to which the French government might be willing to provide emergency humanitarian assistance to countries struck by a sudden natural disaster.

Moving on to the hypothesis according to which domestic politics plays a key role in influencing the disbursement of emergency humanitarian assistance, once again the evidence seems to suggest that the hypothesis should be discarded. Indeed, this is the case despite the fact that, at first sight, changes in the country's GDP might have had an impact on the dependent variable. However, after a more thorough investigation of the variable and as explained earlier on in this chapter, the contention that changes in the country's GDP have a significant impact on disbursements on humanitarian assistance should be treated with the greatest caution. Having said that and less controversially, the other three independent variables investigated for this hypothesis clearly do not account for variation in the dependent variable.

Within the context presented above, the contention that the *modus operandi* of a country's humanitarian mechanism can impact the extent to which its humanitarian agency is ready to provide emergency humanitarian assistance following the onset of a natural disaster cannot readily be confirmed nor disconfirmed. That is the case because, according to the four

indicators under investigation (administrative capacity, degree of internationalisation, freedom from undue political interference and overall financial commitment to the provision of overseas development assistance), France scores mixed results. Indeed, that is clearly the case in a situation whereby, while being highly "internationalised" in its outlook and displaying a significantly above-average administrative capacity, the French humanitarian agency seems to be subject to remarkably persistent political interference as well as unpredictable budgetary constraints on behalf of the central government.

### 4.8. Denmark

This final part of the chapter dedicated to the data analysis presents the results obtained for Denmark. As it has been the case with the previous donor countries under investigatin, this part of the chapter consists of three sections. A first section is dedicated to the quantitative analysis of the "domestic politics" and "disaster magnitude" hypotheses, a second section focuses on the qualitative investigation of the "humanitarian mechanism" hypothesis and a third one provids a summary of the major findings.

#### 4.8.1. Data analysis for the "domestic politics" and "disaster magnitude" hypotheses

Figure 4.8.1.1. Multiple regression analysis for all the independent variables

Number of observations=210
Time periods=10

| log_disburse | Coef. | Std. Err. | P>\|z\| |
|---|---|---|---|
| gdpus | -9.913 | 7.664 | 0.196 |
| catastroph~y | -0.024 | 0.044 | 0.585 |
| clgovernment | -0.054 | 0.075 | 0.473 |
| election | -0.062 | 0.088 | 0.481 |
| fatalities | 0.113 | 0.076 | 0.136 |
| affected | -0.065 | 0.059 | 0.271 |
| damage | 0.021 | 0.070 | 0.764 |
| totarticles | -0.054 | 0.084 | 0.523 |
| _cons | 0.741 | 0.464 | 0.110 |

*Key:*

*log_disburse: Logarithmic disbursement (dependent variable)*

*gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation*

*catastroph˜y: Catastrophe day (days elapsed since the onset of a selected natural disaster)*

*clgovernment: Centre-left government (presence or not of centre-left parties in government)*

*election: Election (presence or not of electoral period in the donor country)*

*fatalities: Fatalities (number of fatalities recorded for natural disaster under investigation)*

*affected: Affected (number of people affected by the natural disaster under investigation)*

*damage: Damage (estimated damages recorded for the natural disaster under investigation)*

*totarticles: Total articles (total articles recorded on the natural disaster under investigation*

*_cons: Constant*

*Source: the author.*

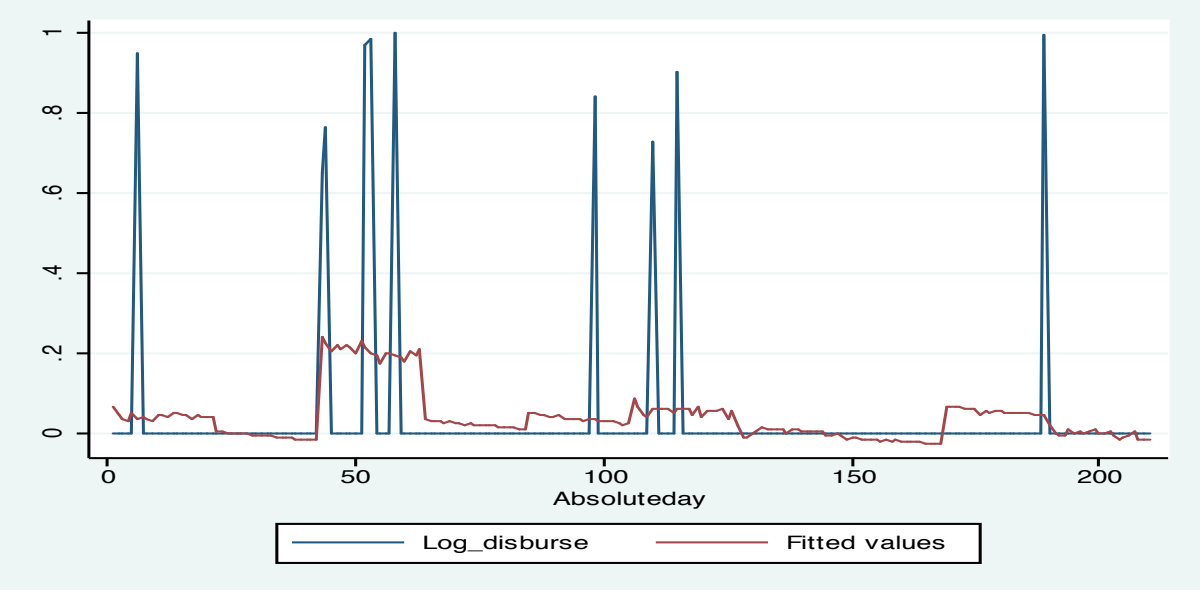
Figure 4.8.1.1 presents the results obtained with the Multiple Regression Analysis (MRA) carried out through Generalised Least Squares (GLS) for Denmark for the ten natural disasters under investigation.

The P > z values obtained in figure 4.8.1.1 highlight the fact that no single independent variable among those under investigation is able to account for disbursements of emergency humanitarian assistance on behalf of the Danish government. That is clearly the case in that the independent variable with the best result (the number of fatalities recorded) still records a staggering P > z value of 0.136: far from being in any way significant. Therefore, in the case of Denmark, the data obtained through the multiple regression analysis suggests that no single independent variable among those investigated can adequately predict Danish disbursements of humanitarian assistance to disaster-stricken countries. Having said that, the multiple regression analysis can still be analysed for eventual issues of multicollinearity by computing for the tolerance value by regressing one of the explanatory variables on all other explanatory variables. The results obtained show that no multicollinearity is recorded (no VIF in excess of 20 and no 1/VIF below .05).

In light of the results obtained in the multiple regression analysis presented above, three final considerations can be made for the Danish case study. To begin with, none of the variables that had been selected to investigate either the hypothesis according to which the magnitude of a natural disaster or the one according to which the country's domestic politics might influence the provision of emergency humanitarian assistance to countries struck by a sudden

natural disaster seem able to predict variation in the dependent variable. Therefore, both these two research hypotheses can be discarded. Secondly, the fact that no independent variable successfully accounts for variation in the levels of disbursement suggests that the *modus operandi* of the Danish humanitarian agency might significantly differ from the one of the other donor countries under investigation and that a more thorough analysis of the Danish humanitarian system might provide interesting insights as to which additional variables could be investigated so as to account for variation in the levels of disbursements. Finally, the fact that the results obtained are coupled with Denmark's stellar performance in the field of humanitarian assistance vis-à-vis the other donor countries under investigation, suggests that the Danish humanitarian system might simply be working on a "level of sophistication" that goes beyond the one of the other donor countries taken into account by this research study.

Figure 4.8.1.2. Comparison of the observed and the predicted values of the disbursements



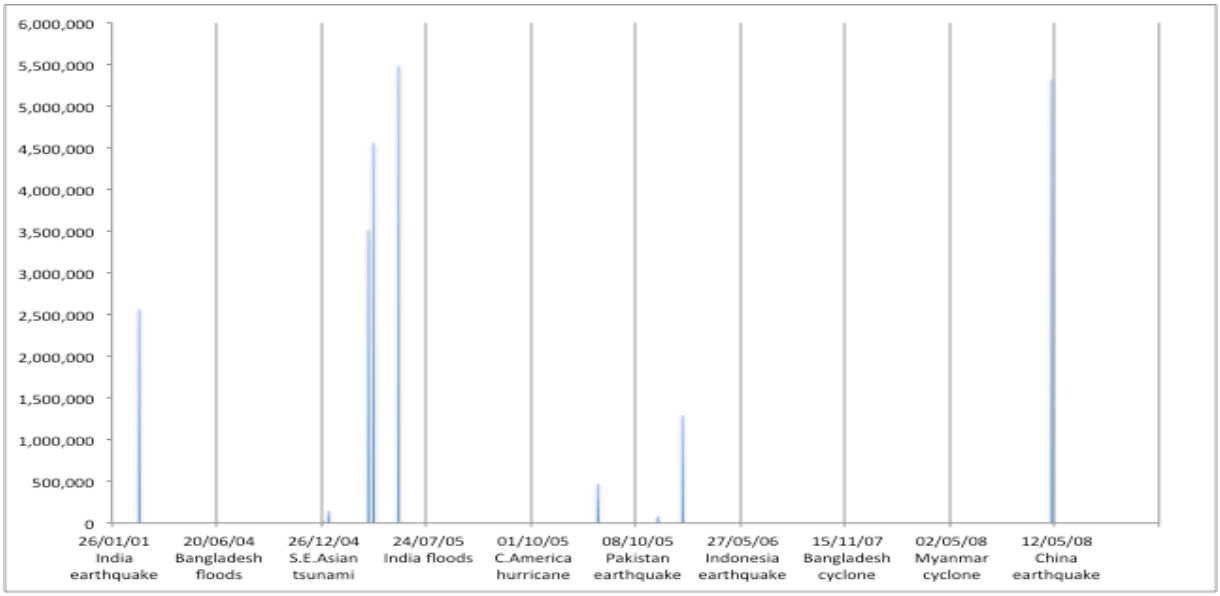

*Source: the author.*

Figure 4.8.1.2 presents the logarithm of the disbursement value and its estimated values for the twenty-one days following the onset of each one of the ten natural disasters analysed throughout the 1st of January 2000 to 31st of December 2008 period.

The graph provided confirms what has already been highlighted by the multiple regression analysis: with no identified significant independent variables, the mathematical model does not manage to meaningfully predict Danish disbursements of humanitarian assistance. In this respect and as it is the case with Italy, Denmark presents an empirical puzzle in that none of the independent variables under investigation seem to be able to adequately predict eventual

disbursements of emergency humanitarian assistance. Indeed, the reduced model employing only the most significant independent variable spresented above can successfully predict only those disbursemnts that took place on the occasion of the South-East Asian tsunami of the 26th of December 2004.

Figure 4.8.1.3. Disbursements for the 21 days following each natural disaster




*Source: the author on elaborations from the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (UN OCHA).*

Figure 4.8.1.3 illustrates the amount of emergency humanitarian assistance disbursed by the Danish government to the victims of the ten natural disasters under investigation for the 1st of January 2000 to the 31st of December 2008 period of analysis as recorded through OCHA's Financial tracking System (FTS).

The largest disbursements provided by the Danish government took place on the occasion of the South East Asian tsunami of the 26th of December 2004. Indeed, on this occasion the Danish government made five separate disbursements. Two relatively minor disbursements to the tune of US$ 25,000 and US$ 149,649 took place immediately after the onset of the catastrophe on absolute days 43 and 44 respectively. These two initial disbursements were then followed by three much larger disbursements well into the second and third week following the onset of the tsunami. These three donations were to the tune of US$ 3,516,540, US$ 4,562,044 and US$ 5,485,095 respectively. These five disbursements amounted to a total of US$ 13,738,328 and made the December 2004 tsunami by far the natural disaster that

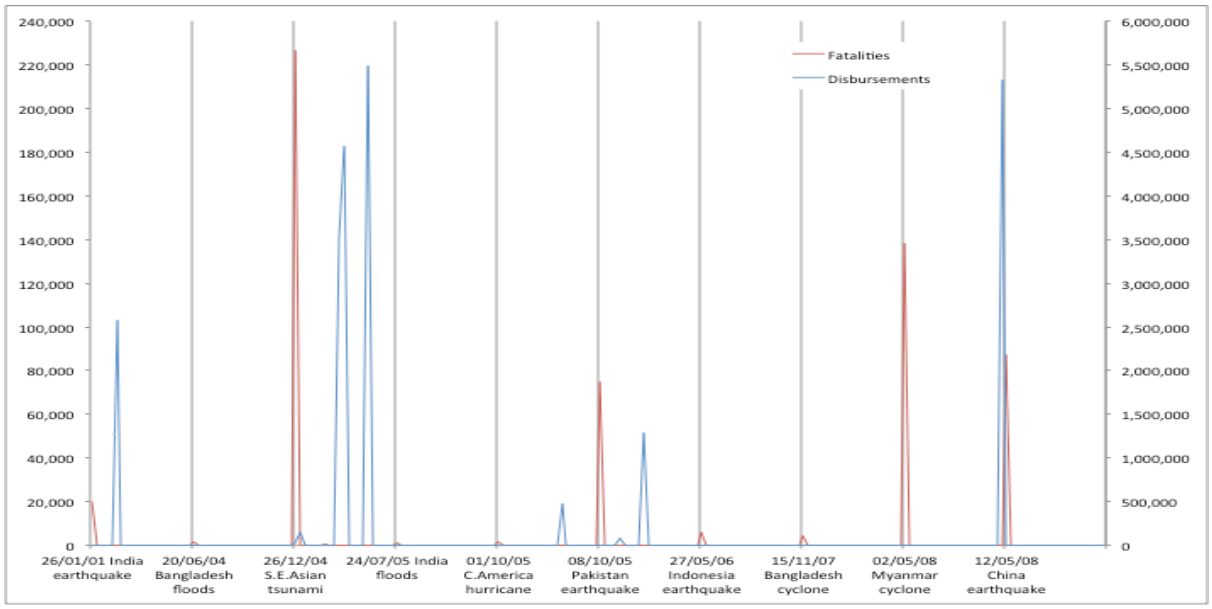
received the most financial assistance from the Danish government among all the natural disasters under investigation.

Among all the catastrophes under investigation, Cyclone Nargis that made its landfall on the coasts of Myanmar on the 2nd of May 2008 is the natural disaster whose victims have received the second largest amount of financial assistance from the Danish government. On this occasion, the Danish government disbursed US$ 5,323,623 but made sure to do so only at the very end of the third week following the onset of the crises. Indeed, as it has been the case with other donor countries, the fact that humanitarian assistance was provided so late into the emergency might be re-conduced to the complicated political and diplomatic conditions surrounding the emergency due to the conduct of the ruling Burmese military junta.

The victims of a natural disaster to have received the third largest amount of emergency financial assistance from the Danish government are those of the Gujarat earthquake of the 26th of January 2001. On this occasion, the Danish government disbursed US$ 2,569,499. A distant fourth and fifth, two more natural disasters recorded the disbursement of emergency financial assistance from the Danish government as recorded through OCHA's Financial Tracking System (FTS).

The victims of the Pakistani earthquake that struck Kashmir on the 8th of October 2005 received a small disbursement of US$ 83,622 followed by a much more significant one of US$ 1,293,463 while the victims of hurricane Stan in Central America in October 2005 received US$ 470,970 in emergency financial assistance. The victims of the Bangladesh floods of June 2004, the Indian floods of July 2005, the Java earthquake of May 2006, cyclone Sidr in November 2007 and the Sichuan earthquake of May 2008 did not receive any emergency financial assistance from the Danish government as recorded by the United Nations Office for the Coordination of Humanitarian Affairs' Financial Tracking System.

Figure 4.8.1.4. Fatalities and disbursements for the 21 days following a disaster (US$)




*Source: Elaborations of the author on data provided by the International Emergency Events Database (EM-DAT) of the Centre for the Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain and the Financial Tracking Service (FTS) of the United Nations' Office for the Coordination of Humanitarian Affairs (OCHA).*

Figure 4.8.1.4 illustrates the relationship between the recorded fatalities and the disbursements provided by the Danish government for each one of the ten natural catastrophes under investigation.

A number of dynamics can be observed by looking at the graph. Firstly, significant disbursements of emergency financial assistance do not necessarily take place immediately after the onset of a catastrophe but might rather come about well into the second or the third week following the onset of an emergency. This can be clearly observed on the occasion of the South East Asian tsunami of the 26th of December 2004, hurricane Stan in October 2005 and cyclone Nargis in May 2008. Secondly, on those occasions when emergency financial disbursements do take place immediately following the onset of a natural disaster, these disbursements tend to be extremely limited and, eventually, followed by much more significant disbursements at a later stage. Indeed, this pattern can be observed for the December 2004 tsunami as well as for the earthquake that struck Pakistani-controlled Kashmir on the 8th of October 2005. Thirdly, five out of the ten natural disasters under investigation recorded a situation whereby the victims of a humanitarian emergency have received no assistance whatsoever from the Danish government. This was the case for the

victims of the floods that struck Bangladesh in June 2004, those of the floods that affected the Mumbai region in July 2005, those of the Java earthquake of the 27th of May 2006, the Bangladeshi victims of cyclone Sidr in November 2007 and those of the Sichuan earthquake of the 12th of May 2008. Finally, it is worth observing that the amount of emergency financial assistance provided by the Danish government on the occasion of each natural disaster is clearly not depending only upon the total number of fatalities recorded.

### 4.8.2. Data analysis for the "humanitarian mechanism" hypothesis

While the previous chapter quantitatively dealt with the first two hypotheses under investigation, this chapter investigates the "humanitarian mechanism" explanation by qualitatively exploring the four independent variables selected for it.

1. Internationalisation

The Danish humanitarian aid system is characterised by a tremendous degree of internationalisation. Indeed, Denmark is not only a proactive promoter and participant in a variety of multilateral initiatives. Additionally, Copenhagen is committed to develop its own national initiatives with the specific aim of strengthening the work of the international humanitarian community.

To begin with, Denmark is a member of the OECD's Development Assistance Committee (DAC) since 1963: Copenhagen has therefore been part of international efforts to alleviate poverty around the world from their very onset. Secondly, the country is also a signatory to the International Aid Transparency Initiative (IATI) launched by Sweden and the United Kingdom in 2003. Thirdly, Denmark has signed up to and has been a staunch supporter of the 2005 Paris Declaration On Aid Effectiveness. Fourthly, the Nordic country has been continuously promoting the aims of the 2008 Accra Agenda for Action (AAA). Fifthly, in 2007 Denmark's was a co-chair of the Good Humanitarian Donorship Group (GHD). Finally, the latest assessment carried out by Development Assistance Research Associates (DARA) through the 2010 Humanitarian Assessment Index ranked Denmark first worldwide in terms of the quality of the humanitarian aid provided to less economically developed countries (DARA 2010).

Aside from what has been mentioned above, Denmark's development and humanitarian aid policies were last subjected to intense scrutiny through peer review by the OECD's Development Assistance Committee in 2007 (DAC 2007) and are due to be newly assessed in

light of the recently published development and humanitarian aid strategies for the 2011 to 2015 period (DANIDA 2010a; DANIDA 2010b). Within this context and on top of its participation in a variety of multilateral initiatives, Copenhagen is committed to take individual action to independently strengthen the international humanitarian community. Indeed, a peculiarity of the Danish humanitarian aid system rests with the International Humanitarian Service (IHB). This is a roster comprising up to 800 highly skilled and specialised professionals that can be made available and deployed at short notice for CFSP or humanitarian aid missions worldwide as result of the strategic decisions carried out by the Humanitarian Contact Group and formalised by the Danish Foreign Ministry (GHK 2010). For all the reasons mentioned above, Denmark can certainly be seen as a particularly active and committed member of the international humanitarian community.

2. Financial commitment

The degree of financial commitment displayed by Denmark to the provision of both humanitarian and development assistance is extraordinary by all accounts. Indeed, a number of observations contribute to highlight Copenhagen's leading position in Europe and beyond in terms of financial resources dedicated to aid economically less developed countries.

To begin with, an investigation of the relative amount of financial resources that Denmark dedicates to the provision of Overseas Development Assistance (ODA) reveals Copenhagen's dedication to development aid policies. This commitment immediately becomes apparent by looking at the average percentage of Gross National Income (GNI) that Denmark dedicates to the provision of ODA for the period under investigation against the other six donor countries analysed in this dissertation. Indeed, while the average percentage of GNI dedicated by all donor countries under investigation in the period from the 1st of January 2000 to the 31st of December 2008 is equal to 0.46% of their GNIs, the percentage that Denmark dedicated to the provision of ODA within the same period was a staggering 0.88% (UNData 2011). While confined to the disbursement of long-term Overseas Development Assistance (ODA), this finding is also in line with the outstanding performance recorded by Denmark in terms of its provision of emergency humanitarian assistance to disaster-stricken countries as previously highlighted by this dissertation.

From a more historical perspective, two distinct phases can be observed in Denmark's budgetary commitments. On the one hand, throughout the 1995 to 2004 period Danish humanitarian aid remained relatively constant hovering between a low of US$ 157.2 million

in 2002 and a high of US$ 217.7 million in 1996. On the other hand, from 2005 onwards Danish humanitarian assistance increased substantially to a new peak of US$ 316.3 million (in 2005 itself) and it then stabilised around this new threshold with expenditures of US$ 306.1 in 2006, US$ 274.7 million in 2007 and US$ 295.4 million in 2008 respectively (GHA 2011). A word of caution is however in order at this stage. If between 2005 and 2008 Danish humanitarian aid increased substantially compared to previous years, not the same can be said of total Danish Overseas Development Assistance (development and humanitarian aid combined). Indeed, while between 1995 and 2001 the total amount of Overseas Development Assistance (ODA) provided by Denmark recorded a gradual but continuous increase reaching a total of US$ 3.1 billion in 2001, the following years saw a substantial drop in Denmark's commitment. In fact, between 2003 and 2008, Danish humanitarian and development assistance combined (i.e. understood as a combination of both long-term development aid commitments and short-term humanitarian assistance) stabilised between a low of US$ 2.5 billion in 2003 and a high of US$ 2.7 billion in 2008 (GHA 2011). The amount of financial resources dedicated by Denmark to both humanitarian and development aid policy between 2002 and 2008 is therefore significantly more limited than what it had been in the years between 1995 and 2001 but nevertheless still exceptional compared with the resources allocated by the other donor countries under investigation.

3. Operational independence

The provision of humanitarian assistance on behalf of the Danish government to disaster-stricken countries is likely to be remarkably free of undue political interference. An investigation of DANIDA's management structure, of its humanitarian five-year strategic plan, of the recipients of Danish humanitarian assistance and of the channels chosen to deliver it, all suggest the existence of a state of affairs whereby the Danish Department for Humanitarian Assistance and NGO Co-Operation can enjoy substantial operational independence in its policy-making.

To begin with, the Danish International Development Agency (DANIDA) has found a creative way to ensure a clear separation of responsibility between its political leadership and its operational management. Christian Fiis Bach is the political head of both the Danish International Development Agency (DANIDA) and the Department for Humanitarian Assistance and NGO Co-Operation. Like DANIDA, the Department for Humanitarian Assistance and NGO Co-Operation is an agency located within the Danish Foreign Ministry and headquartered in Copenhagen. The department's operational management is, however,

characterised by a high degree of decentralisation whereby the bulk of decision-making is largely delegated to humanitarian advisors in Kabul, Addis Ababa and Nairobi. Such an administrative set up ensures that, while political responsibility for the delivery and the quality of Danish humanitarian assistance is centralised in Copenhagen, policy decisions and operational control are delegated to professionals on the field.

Secondly and from a strategic policy-making point of view, the fact that Danish humanitarian policy is developed according to a five-year strategic plan contributes to ensure that the provision of Danish humanitarian assistance is less likely to be hijacked by foreign policy considerations that might suddenly arise within the country's foreign ministry. The current strategy for development cooperation runs from 2011 to 2015 and it focuses specifically on the world's forty-three most fragile states (DANIDA 2010a; Ministry of Foreign Affairs of Denmark 2010). As part of this strategy, Denmark is to focus all its humanitarian assistance on the world's forty-three most fragile states and on seven other countries that have recently experienced exceptional socio-political and economic upheaval: Afghanistan, Ethiopia, Iraq, Myanmar, the Occupied Palestinian Territories, Somalia and Sudan. Also from 2011 year onward, 20% of the country's annual humanitarian budget is specifically set aside for unforeseen humanitarian catastrophes, thus highlighting a renewed focus on humanitarian assistance and the management of sudden emergencies (Ministry of Foreign Affairs of Denmark 2010). The fact that a significant proportion of Danish humanitarian assistance is already set to be concentrated on some of the world's most fragile states is a good indicator of the fact that the recipients of Copenhagen's humanitarian aid are most likely to be selected according to humanitarian criteria rather than geostrategic ones.

Thirdly and in terms of the main recipients of Danish humanitarian assistance, the last year of analysis of this dissertation well illustrates long-term and well-established trends that characterise the destination of Danish humanitarian aid flows. In 2008, the top six recipients of Danish humanitarian aid were Palestine with US$ 30.5 million (11.7% of the yearly total), Sudan with US$ 28.8 million (11% of the total), Somalia with US$ 19.1 million (7.3%), Iraq with US$ 18.1 million (6.9%), Myanmar with US$ 15.6 million (6%) and Afghanistan with US$ 14.4 million (5.5% of the total). Interestingly, throughout the last 5 years of analysis (2004 to 2008 included), the Occupied Palestinian Territories (OPT) were always either the top or the second largest recipient of Danish humanitarian aid thanks to significant funding channelled through UNRWA (GHA 2011).

Finally, when looking at the channels that are most likely to be used for the provision of humanitarian aid, Copenhagen's overwhelming preference for using multilateral channels over bilateral ones highlights once more highlights Denmark's non-partisan use of its humanitarian assistance. Denmark allocates an overwhelming proportion of its humanitarian financing through multilateral channels and NGOs, therefore limiting the extent through which its own humanitarian assistance could be used as a 'foreign policy lubricant'. Indeed, in 2008 alone, Denmark has spent 63% of its humanitarian aid through multilateral channels (including the European Commission) and 24% of its humanitarian budget through NGOs (GHA 2011). These data exemplify a pattern that has become well established over the years and that it consistently sees multilateral organisations and NGOs accounting for well over 80% of the country's channelled expenditures. Indeed, such pattern can once more be exemplified by a quick look at our last year of analysis (2008) for what concerns the top-ten first-level recipients of Denmark's humanitarian aid. In 2008, these were UNHCR with US$ 53.1 million, WFP with US$ 46.1 million, the European Commission with US$ 41.3 million, the Danish Refugee Council with US$ 20.4 million, the Danish Red Cross with US$ 15 million, UNRWA with US$ 14.5 million, UNICEF with US$ 12.8 million, Danish Churchaid with US$ 10 million, Save the Children Denmark with US$ 6.4 million and, finally, the ICRC with US$ 6.2 million.

4. Administrative capacity

The administrative capacity displayed by both DANIDA and its Department for Humanitarian Assistance and NGO Co-Operation is enhanced by a number of particular arrangements. These include the position of the department for humanitarian aid within DANIDA's overarching administrative set up, DANIDA's tremendously decentralised structure, its cooperation with other Danish humanitarian actors and the human and financial resources provided to DANIDA's country offices.

To begin with, the fact that the Danish International Development Agency (DANIDA) is provided with a specialised department solely dedicated to the provision of humanitarian assistance contributes to enhance the quality of the Danish humanitarian response to sudden emergencies. The Department for Humanitarian Assistance and NGO Co-Operation operates under the direct supervision of the Head for Multilateral Affairs. She or he is also one of two Under Secretaries that, together with the State Secretary, are charged with the running of the so-called South Group: the *ensemble* of ministries, agencies and departments within the Danish government that directly or indirectly work in the field of development and

humanitarian aid policies with economically less developed countries. The fact that a member of the South Group's "triumvirate" also happens to be directly responsible for the work carried out by the Department for Humanitarian Assistance and NGO Co-Operation, inevitably enhances the profile of the department itself vis-à-vis other departments within DANIDA.

Secondly, in the case of Denmark, the decentralisation of decision-making procedures in the field of humanitarian assistance has not translated into fragmentation of DANIDA's operational capacity. While ultimate political responsibility for the strategic oversight of both development and humanitarian assistance lays with the Ministry of Foreign Affairs in Copenhagen, responsibility for designing and delivering aid programmes rests with country offices. The advantages provided by this set up are numerous: faster response to humanitarian emergencies, greater flexibility to adapt to the specific needs of partner countries and enhanced cooperation with other donors in the field being some of them (DAC 2007). As result of what mentioned above, the highly decentralised decision-making structure upon which humanitarian policy is developed has not resulted into operational fragmentation but, rather, into the organisation's enhanced administrative capacity.

Thirdly, the Danish government has successfully managed to institutionalise and enhance a structured dialogue with all relevant stakeholders of the Danish humanitarian aid system. Established in 1995 under the aegis of the Danish Foreign Ministry, the Humanitarian Contact Group is a Copenhagen-based network that brings together humanitarian aid practitioners, NGOs and ministry officials. The twenty-four bodies belonging to it meet in order to collectively discuss and coordinate both long-term humanitarian strategies as well as the handling of sudden onset emergencies (DANIDA 2011). The Humanitarian Contact Group therefore can now complement the broader Council of International Development Cooperation that was originally established already in 1971 and contribute to streamline and improve the administrative practices of both DANIDA and its partners.

Last but not least, the fact that individual country offices bear individual responsibility for the design and the implementation of aid programmes has encouraged DANIDA to endow these with substantial human and financial resources. On the one hand and from a human resources point of view, the vast majority of staff employed by DANIDA works on the field rather than in Copenhagen. Indeed, out of a total of 1087 people employed by the Danish government in the field of development and humanitarian aid policy, 295 individuals are based in Copenhagen while a staggering 792 staff is based in non-OECD countries. On the other hand

and from a financial point of view, what is striking about the Danish humanitarian aid system is not only the relative amount of financial resources upon which it can count but, rather, the discretionary use that country offices can make of these. Indeed, while for most of the years under investigation the total amount of humanitarian assistance made available by Denmark hovered around US$ 280,000,000 (GHA 2011), it is impressive to observe that, within the Danish humanitarian aid system, each country office is allowed to independently authorise the disbursement of financial assistance up to the staggering amount of US$ 880,000 (DAC 2007).

### 4.8.3. Summary of the major findings for Denmark

Like Italy and unlike all other case studies under investigation, the multiple regression analysis carried out for Denmark suggests that no single independent variable under investigation accounts for variation in the dependent variable. However, having said that, the similarities between Italy and Denmark are limited to this consideration. Indeed, while Italy scores bottom of the list in almost all indicators investigated throughout this study, Denmark stands out among all case studies under investigation as the undisputed champion in the provision of emergency humanitarian assistance to countries struck by a sudden natural disaster.

When exploring the extent to which the magnitude of a natural disaster might influence the disbursement of emergency humanitarian assistance on behalf of the Danish government, none of the four independent variables selected for this purpose (the number of fatalities reported, the number of people affected, the estimated damages recorded and the number of days that have elapsed since the onset of a natural disaster) seem to be able to account for variation in the dependent variable. A state of affairs, this one, that is encountered also when exploring the four independent variables chosen to analyse the hypothesis according to which the domestic politics of a donor country might affect the extent to which a donor government might be ready to provide emergency humanitarian assistance to countries struck by a sudden natural disaster (the media coverage on a selected natural disaster, the donor country's GDP, whether or not the donor country finds itself in the midst of an electoral period and whether or not it is led by a centre-left government).

While the results obtained through the quantitative analysis are rather disappointing in that they do not manage to highlight any significant correlations between any of the eight selected independent variables and variation in the levels of disbursement of humanitarian assistance,

the qualitative analysis carried out to investigate the hypothesis according to which the *modus operandi* of a country's humanitarian mechanism can impact the provision of humanitarian assistance can at least reveal the outstanding performance of the Danish humanitarian agency vis-à-vis all its European partners under investigation. Indeed, for all four independent variables under investigation (the extent of the humanitarian agency's "internationalisation", the degree of freedom that this can enjoy from undue political pressure, the quality of its administrative capacity as well as the country's overall commitment to the provision of overseas development assistance), Denmark performs significantly better than all the other donor countries under investigation.

Possibly exactly because of the stellar performance of its humanitarian agency, the independent variables that have successfully predicted variation in disbursements of humanitarian assistance in all other donor countries (bar Italy) seem to have failed to highlight meaningful correlations in the Danish case. Indeed, any further research into causal mechanisms accounting for the provision of humanitarian assistance on behalf of the Danish government might wish to explore DANIDA's *modus operandi* in greater detail as a means to understand the forces determining Denmark's policy-making in the field of humanitarian assistance.

## 5. Conclusion

The aim of this dissertation was to investigate which factors were most likely to affect the provision of emergency humanitarian assistance on behalf of European governments to countries that have been struck by a sudden natural disaster. In light of this objective, the added value of this dissertation was threefold. To begin with, this dissertation contributed to fill a gap in the literature by exploring the determinants of humanitarian aid as opposed to the already well-investigated determinants of more long-term development assistance. Secondly, this research provided a useful comparative framework to analyse national policy-making in the field of humanitarian assistance across different European countries. Finally, the work carried out offered some interesting insights for all those socio-political actors that conceive of themselves as key stakeholders of the European humanitarian mechanism and wish to influence its *modus operandi*. Within this dissertation, three alternative explanations have been investigated in order to account for the extent to which European governments might be ready to provide emergency humanitarian assistance to countries struck by a humanitarian catastrophe. A first hypothesis revolved around the understanding that domestic politics is the key factor affecting a donor country's willingness to disburse emergency financial assistance. A second hypothesis identified the magnitude of a natural disaster as the fundamental determinant of a European government's response to the sudden onset of a humanitarian emergency. Finally, a third hypothesis concentrated on a donor country's humanitarian mechanism as the principal factor influencing its government's readiness to provide emergency humanitarian aid to disaster-stricken countries. While the scope of the dissertation was limited to sudden natural disasters and to the provision of humanitarian assistance on behalf of selected European donors, a number of interesting empirical results have nonetheless emerged.

### 5.1. Summary of the main findings

This first part of the conclusion highlights the main empirical findings for each one of the three hypotheses under investigation by presenting the results obtained for the four independent variables employed to analyse them. This part of the conclusion therefore presents both the main quantitative and the key qualitative findings of the dissertation according to the three research hypotheses under investigation. To begin with, the results for the "disaster's magnitude" hypothesis are presented. As a next step, the empirical findings for the "humanitarian mechanism" hypothesis are given. Finally, this chapter highlights the evidence that emerged in relation to the "domestic politics" hypothesis.

### 5.1.1. Empirical findings for the "disaster's magnitude" hypothesis

The magnitude of a sudden natural disaster seems to be a key explanatory factor in determining the extent to which donor countries are prepared to provide emergency humanitarian assistance to a disaster-stricken country. Four independent variables were selected to test the hypothesis according to which the magnitude of a natural disaster is key in determining the extent to which donor governments might be prepared to provide emergency humanitarian assistance to countries struck by a sudden natural disaster. These were the number of fatalities recorded, the number of individuals affected by the humanitarian emergency, the estimated damages caused by the natural disaster and the number of days that have elapsed since the onset of a natural disaster.

Among the four independent variables investigated to determine the magnitude of a natural disaster, the number of fatalities recorded stands out as the most significant one. Both the Multiple Regression Analysis (MRA) that was run for all donor countries combined as well as the individual regressions carried out for each one of the seven donor countries under investigation provided important results in this respect. Indeed, the number of recorded fatalities seems to have a significant degree of influence on the disbursement of emergency financial assistance for all countries combined as well as for disbursements of humanitarian assistance from the United Kingdom, the Netherlands, Germany and France.

Still highly significant, the number of days that have elapsed since the onset of a natural disaster is a second independent variable that also seems to have an impact on the emergency financial assistance provided by the donor countries under investigation. Indeed, the multiple regressions run for all countries combined as well as the ones carried out for Spain and Germany highlight the significance of this independent variable whereby, as the number of days that have elapsed since the onset of a natural disaster increases, the amount of emergency humanitarian assistance provided decreases.

Third among the four independent variables investigated to test the "disaster's magnitude" hypothesis, the estimated damage caused by a natural catastrophe does not seem to be, according to the multiple regression analysis carried out for all donor countries combined, a significant independent variable for all countries combined. This variable seems, however, to be a significant one in the case of humanitarian assistance provided by the French government whereby greater estimated damages correlate with an increase in the amount of assistance provided.

Finally, the number of people affected by a natural disaster (i.e. those individuals that have survived the catastrophe but have been injured, have been displaced or have lost their livelihoods) does not seem to be a significant independent variable for all countries combined. Similarly, when the multiple regression analyses were carried out for each infividual donor country, in no instance did this variable seem to influence the dependent variable.

As result of what has been mentioned above, it can be claimed that the magnitude of a natural disaster is the single most significant factor accounting for variation in disbursements of emergency humanitarian assistance on behalf of donor governments to those countries that have been struck by a sudden natural disaster. More specifically, the number of fatalities recorded and, to a more limited extent, the number of days that have elapsed since the onset of a natural disaster, are the two key factors most likely to influence the decision on behalf of donor countries to disburse emergency humanitarian assistance.

### 5.1.2. Empirical findings for the "humanitarian mechanism" hypothesis

The humanitarian mechanism of a donor country also seems to play a key role in determining the extent of emergency humanitarian assistance that donor governments are ready to offer to countries that have been struck by a sudden natural disaster. In order to investigate this hypothesis, a qualitative analysis of four selected independent variables was carried out. These were the extent to which the donor country in question was committed to work with its partners of the international humanitarian community, the financial commitment displayed by the donor country in question to the overall provision of Overseas Development Assistance (ODA) to developing countries, the administrative capacity enjoyed by the donor country's humanitarian agency and, finally, the extent to which this can enjoy freedom from undue political interference from its national government.

To begin with, a strong correlation seems to exist between the extent to which a donor country's humanitarian mechanism is embedded within the international humanitarian community and the extent to which its government is ready to provide humanitarian assistance to countries affected by a humanitarian catastrophe. Indeed, the evidence suggests that countries that play a particularly active role within the international humanitarian community such as Denmark, the Netherlands and the United Kingdom, also provide the most significant amounts of emergency humanitarian assistance as a percentage of their Gross National Incomes (GNIs). Conversely, countries that have either only relatively recently joined the humanitarian stage such as Spain or that appear to be less engaged with it such as

Italy, also happen to have contributed least to the provision of humanitarian aid for the ten natural disasters under investigation in this dissertation.

Secondly, there appears to be a strong correlation between the amount of humanitarian assistance that a country provided for the ten natural disasters under investigation and its broader financial commitment to support economically less developed countries. Evidence of such a state of affairs can be found in the fact that the two countries that provided the highest average percentage of their respective GNIs for the provision of long-term Overseas Development Assistance (ODA) throughout the whole period of analysis (Denmark and the Netherlands), were also the two top performers in terms of the average percentage of GNI dedicated to the provision of humanitarian assistance for the ten natural disasters under investigation. Conversely, Spain and Italy dedicated the lowest percentages of their GNIs to both the provision of humanitarian aid for the ten humanitarian catastrophes under investigation and for long-term development assistance within the period of analysis.

Thirdly, the extent of humanitarian assistance provided following a humanitarian catastrophe seems also to strongly correlate to the degree of operational independence that a humanitarian agency can enjoy from undue political pressure. Once again, countries that provided the highest average percentages of their GNIs in humanitarian aid for the ten natural disasters under investigation (Denmark, the Netherlands and the United Kingdom) also seem to be the ones where policy-decisions are most likely to be taken according to humanitarian criteria rather than to geostrategic ones. In line with this finding, the evidence suggests that Italy and, to a more limited extent, Spain and France are countries where the national humanitarian agencies might be more likely to be the target of undue political pressure.

Finally, there also appears to exist a strong correlation between the administrative capacity of a donor country's humanitarian agency and the extent of its provision of humanitarian assistance following the onset of a natural disaster. Indeed and at the two extremes of an ideal spectrum, Denmark and Italy seem to display the best and the most deficient administrative structures respectively in terms of their countries' humanitarian agencies. In line with this finding, the two countries mentioned above scored very good and very poor performances respectively in terms of their provision of humanitarian assistance to the countries affected by the ten natural disasters under investigation.

To sum up, a qualitative analysis of the *modus operandi* of the seven donor countries under investigation seems to highlight a strong correlation between the quality of a donor country's

humanitarian mechanism and the extent to which its humanitarian agency will be ready to disburse emergency humanitarian assistance to countries struck by a sudden natural disaster. Indeed, those donor countries, such as the Netherlands and Denmark, that display the best performances in terms of their engagement with the international humanitarian community, that can enjoy the most freedom from undue political pressure from their governments, that can rely on the most sophisticated administrative capacities and that can operate within countries that dedicate the most substantial budgets as a percentage of their GDPs to the provision of long-term overseas development assistance, tend to also be the best performers in terms of the provision of emergency humanitarian assistance to countries struck by a sudden natural disaster.

### 5.1.3. Empirical findings for the "domestic politics" hypothesis

Unlike as it has been the case in the two previous hypotheses, the evidence does not support the hypothesis that domestic politics play a significant role in influencing the provision of emergency assistance on behalf of donor governments to countries that have been struck by a sudden natural disaster. In order to come to this conclusion and to operationalize the research hypothesis that is now to be discarded, four independent variables had been investigated. These pertained to the presence or not in the government of the donor country of a centre-left coalition, to whether or not the donor country in question was finding itself in the midst of an electoral period when a sudden natural disaster took place, to the country's gross domestic product and to the extent to which the donor country's national media covered the natural disasters under investigation.

To begin with, the size of a donor country's economy seems at first sight to influence the amount of emergency financial assistance that the respective government is ready to provide to the victims of a sudden natural disaster. However, such a result can be disputed on three grounds. First of all, the fact that the coefficient recorded for this independent variable for all countries combined is negative invites some caution and should ideally be investigated as part of a further research agenda: it indeed seems unlikely that, as a country's Gross Domestic Product (GDP) increases, the country's provision of humanitarian assistance should decrease. Secondly, the fact that the standard error for a donor country's gross domestic product is consistently high across various regressions should invite great caution when assessing the reliability of the variable's output. Finally and when computing for the tolerance value of the multiple regression analysis carried out for all donor countries under investigation combined, the independent variable represented by a country's GDP is characterised by a significant

degree of multicollinearity with other independent variables. Because of the reasons mentioned above, the claim that increases in a country's GDP influence the country's disbursement of humanitarian assistance shall be regarded with the outmost suspicion, cannot be taken at face value and should be the subject of eventual further research.

Secondly, the degree of attention dedicated by the media to a natural disaster is not a significant variable. Indeed, media attention seems to influence the eventual disbursement of humanitarian assistance only in the specific case study represented by the Netherlands. Such a finding must, however, not be taken at face value for two fundamental reasons. On the one hand, the number of disbursements of humanitarian assistance provided by the Dutch government for the ten natural disasters under investigation is, unlike in the case of other donor countries, absolutely minimal: a state of affairs that is likely to negative impact upon the quality of the multiple regression analysis carried out for the country. On the other hand and as it has been highlighted through various graphs and bivariate analysis, the evidence provided for both the specific case studies as well as for all countries combined suggests that increases in issue salience follow the number of fatalities recorded rather than anticipating disbursements of humanitarian assistance. The fact that media coverage is not a significant independent variable in terms of its influence on the dependent variable for any of the other countries under investigation also suggests great caution when claiming that media coverage might influence disbursements.

Thirdly, the political orientation of the party in government does not seem to be a significant independent variable in terms of its influence on the dependent variable. Indeed, the multiple regression analysis carried out for all countries combined as well as the ones carried out individually for each donor country under investigation do not identify the political orientation of a government's ruling coalition as a factor that influences the provision of humanitarian aid. A result, this one, that seems to discredit the idea that left-leaning political parties in government, should be, due to their ideological roots, more prepared than conservative governments to engage with economically less developed countries.

Finally, whether or not a donor country finds itself in an electoral period immediately antecedent to a national election does not seem to be significant either. Indeed, no multiple regression analysis carried out either for all donor countries combined or for an individual donor highlights such a correlation. Whether or not a donor country might be in the midst of an electoral period seems therefore not to have an impact on the potential disbursement of humanitarian assistance.

As result of what has been described above, it is safe to claim that domestic politics are not a key factor accounting for changes in the extent to which European donor countries are ready to provide emergency humanitarian assistance to third countries struck by a sudden natural disaster. Indeed, none of the four independent variables that had been selected to explore whether or not internal political dynamics could affect humanitarian aid disbursements could convincingly succeed in accounting for variation in the dependent variable.

### 5.2. Areas identified for further research

After having presented the key results obtained for the three hypotheses under investigation, the second part of this last chapter concludes the dissertation with a number of observations on issues that have been identified as potential areas for further research. These concentrate on the empirical puzzle presented by Denmark and Italy and, more generally, on the opportunity to explore the socio-cultural dimension of the donor countries under investigation in order to gain a better insight on those variables that might play a key role in influencing the provision of humanitarian assistance.

To begin with, the results obtained for Denmark present an empirical puzzle that deserves to be further explored. While in absolute terms the United Kingdom was the single largest provider of humanitarian assistance to the various countries affected by the ten natural disasters under investigation, in relative terms Denmark was by far the most generous donor country. Indeed, while having the smallest economy among the seven donor countries under investigation, in absolute terms Denmark came in sixth position in terms of the total amount of emergency financial assistance provided for the ten natural disasters under investigation. In this respect, Denmark performed behind the United Kingdom, Germany and France but well ahead of a country with a significantly larger economy such as Spain. Indeed, dedicating 0.0020% of its GNI to the provision of humanitarian assistance for the ten natural disasters under investigation, in absolute terms Denmark comes just short of providing more emergency financial assistance than either the Netherlands or Italy: two countries that, according to their economic sizes, should easily outdo many times over Denmark in terms of total humanitarian assistance provided. While being the top performer in terms of humanitarian assistance provided among the seven donor countries under investigation, Denmark also presents an empirical puzzle in that none of the independent variables quantitatively explored through the multiple regression analysis for either the “disaster’s magnitude” hypothesis or for the “domestic politics” hypothesis seem to be able to account for variation in the dependent variable. While the qualitative analysis carried out for the

independent variables selected for the "humanitarian mechanism" hypothesis provides some insights into Denmark's performance, a more thorough investigation of the country's socio-political dimension would therefore be needed in order to better grasp the reasons for the country's stellar performance.

Unlike Denmark, Italy is a country that performs particularly poorly in terms of its provision of emergency humanitarian assistance to disaster-stricken countries. Like Denmark, however, Italy deserves special attention in that there seems to be no independent variable capable of accounting for variation in the dependent variable in relation to the "disaster's magnitude" and the "domestic politics" hypotheses. While it might be entirely conceivable for the model selected for the Multiple Regression Analysis (MRA) to be inappropriate, the same model has been able to provide interesting insights for the other donor countries under investigation. While the institutional weaknesses discovered within the *modus operandi* of the Italian Directorate General for Development Cooperation (DGCS) by the qualitative analysis carried out for the "humanitarian mechanism" might partially account for Italy's poor performance, further research on the country's political and humanitarian contexts should be carried out in order to better understand the reasons for Italy's results. Both in the case of a country such as Denmark that performs particularly well in terms of its provision of humanitarian assistance to disaster-stricken countries as well as in one such as Italy that records a particularly poor performance, the multiple regressions seemed unable to identify key independent variables responsible for variation in the dependent variable. Both these countries therefore present empirical puzzles that would be worth investigating through further research.

Aside from Denmark and Italy, all donor countries under investigation can be clustered into three groups not only according to their performance in terms of humanitarian assistance provided, but also according to their broader socio-cultural characteristics. Within such an understanding, Denmark finds itself in a league of its own in terms of its provision of humanitarian assistance for the ten natural disasters under investigation. Interestingly, Denmark also happens to be a high-income, small, protestant, north-European country with a very limited colonial history and a very high ranking in the United Nations' Human Development Index (HDI). In terms of their commitment to the provision of humanitarian assistance to disaster-stricken countries, the Netherlands, the United Kingdom, France and Germany make up a second cluster of countries. Aside from sharing more average performances on the dependent variable, these four countries display a somewhat lower average income per capita than Denmark, have large populations (at least for European

standards), have a mixed protestant and catholic background, generally display a lower HDI than Denmark and have substantial colonial histories. Last but not least, as the two donors that provided the least humanitarian assistance for the ten natural disasters under investigation, Italy and Spain make up a third cluster of countries characterized by a number of similarities. Indeed, both of these south European countries display a staunchly catholic background, extensive colonial histories, lower incomes per capita and HDIs than the other countries under investigation and medium-sized populations. While the presence of a causal mechanism between these characteristics and the dependent variable cannot at this stage be established, the presence of these common patterns nevertheless provides some interesting insights that could be further investigated when trying to explore the determinants of humanitarian assistance provision from a more socio-cultural perspective.

**Bibliography**

ABC (2010) "Un Zapatero en Cooperación". Available at: http://www.abc.es/20101101/espana/zapatero-cooperacion-20101101.html Last accessed: March 27th, 2012.

Agence France-Presse – AFP (2011) "Bangladesh - Deaths, and costs, mount in South Asia floods as disease breaks out". Available at: http://wwww.reliefweb.int/rw/rwb.nsf/AllDocsByUNID/c8d287b9d8929b10c1256ee10034c349 Last accessed: January 7th 2011.

Aidinfo (2010) "Better Information, Better Aid". Available at: http://www.aidinfo.org/better-information-better-aid.html Last accessed: April, 8th, 2011.

Amateur Seismic Centre ASC of India - ASC (2001) "M7.7 Bhuj "Republic Day" Earthquake, 2001". Available at: http://asc-india.org/lib/20010126-kachchh.htm Last accessed: January 7th, 2011.

Active Fault Research Centre - AFRC (2005), "December 26 Tsunami in Indian Ocean". Available at: http://staff.aist.go.jp/kenji.satake/Sumatra-E.html Last accessed: January, 10, 2011.

AECID (2011) "Estatuto de la AECID". Available at: http://www.aecid.es/web/es/normativa/Agencia_espaxola_de_cooperacion_para_el_desarrollo/Estatuto_aecid/index.html Last accessed: April 7th, 2011.

Ashcroft, Emma (1999), 'ECHO – Humanitarian Aid', in Carol Cosgrove-Sacks (ed.), *The European Union and Developing Countries. The Challenges of Globalization*, Houndmills Basingstoke: Macmillan.

Ball, Steph (2007) "Severe Cyclone Sidr Hurtles Towards Bangladesh". Available at: http://www.bbc.co.uk/weather/world/news/15112007news.shtml Last accessed: January 11th, 2011.

Baumgartner, Frank (1997) 'Media Attention and Congressional Agendas' in Iynegar & Reeves (eds.) *Do the Media Govern? Politicians, Voters and Reporters in America.* Thousands Oaks, CA: Sage.

Bell, Stephen and Hindmoor, Andrew (2009) *Rethinking Governance: The Centrality of the State in Modern Society,* New York: Cambridge University Press.

British Broadcasting Corporation – BBC (2005) "Earthquake toll leaps to 73.000". Available at: http://news.bbc.co.uk/2/hi/south_asia/4399576.stm Last accessed: January 10th, 2011.

British Broadcasting Corporation – BBC (2008) "France Angered by Burmese Delays". Available at: http://news.bbc.co.uk/2/hi/asia-pacific/7405998.stm last accessed: January 11th, 2011.

Butler, Barbara (1998) 'Information Subsidies, Journalism Routines and the Australian Media: Market liberalization Versus marketplace Ideas'. *Prometheus,* 16 (1): 27-45.

Budget 4 Change – B4C (2010) "Netherlands ODA Budget Profile", Amsterdam: Development Initiatives.

Chinese Earthquake Administration (2008) "Analysis of the Cause of the M 8.0 Earthquake of the Wenchuan Province". Available at: http://www.cea.gov.cn/manage/html/8a8587881632fa5c0116674a018300cf/_content/08_05/30/1212119940937.html Last accessed: January 11th, 2011.

Collinson, Sarah and Margie Buchanan-Smith (2002), 'International humanitarian action and the accountability of official donors', Humanitarian Policy Group Briefing Paper Nr. 6, London: ODI.

CONCORD (2007) "Hold the Applause! EU Governments Risk Breaking Aid Promises", Brussels: CONCORD. Available at: http://www.eurodad.org/uploadedFiles/Whats_New/Reports/Hold_the_Applause.FINAL.pdf Last accessed: April 23rd, 2009.

Cooperazione Italiana allo Sviluppo – COOPI (2011) 'Legge 26 Febbraio 1987, Nr. 49 – Nuova Disciplina della Cooperazione dell'Italia con I Paesi in Via di Sviluppo'. Available at: http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:1987;49 Last accessed: March 6th, 2012.

Council of the European Union (1997) 'The Treaty of Amsterdam Amending the Treaty on European Union, the Treaties Establishing the European Communities and Certain Related Acts.' *Official Journal C340, 10th of November 1997.* Amsterdam: Council of the European Union. Available at: http://eur-

lex.europa.eu/en/treaties/dat/11997D/htm/11997D.html Last accessed: March 6th, 2012.

Council of the European Union (2005) *Joint Statement by the Council and the Representatives of the Governments of the Member States Meeting Within the Council, the European Parliament and the Commission on European Union Development Policy: "The European Consensus",* Brussels: General Secretariat of the Council of the European Union.

Council of the European Union (2006) *Financing for Development and Aid Effectiveness: Delivering More, Better and Faster,* Brussels: General Secretariat of the European Council.

Council of the European Union (2007) *EU Code of Conduct on Complementarity and Division of Labour in Development Policy – Conclusions of the Council and of the Representatives of the Governments of the Member States Meeting Within the Council,* Brussels: General Secretariat of the Council of the European Union.

Council of the European Union (2008) *Conclusions of the Council and of the Representatives of the Governments of the Member States Meeting Within the Council on "The EU as a Global partner for Development: Speeding up Progress Towards the Millennium Development Goals (MDG)",* Brussels: General Secretariat of the European Council.

DANIDA (2010a) *Freedom from Poverty, Freedom to Change – Strategy for Denmark's Development Cooperation,* Copenhagen: Ministry of Foreign Affairs of Denmark.

DANIDA (2010b) *Strategy for Danish Humanitarian Action 2010-2015,* Copenhagen: Ministry of Foreign Affairs of Denmark.

DANIDA (2011) *The Danish Humanitarian Contact Group*. Available at: http://um.dk/en/danida-en/ Last accessed: December 19th, 2011.

DARA (2008) *The Humanitarian Response Index 2008,* Madrid: DARA. Available at: http://daraint.org/wp-content/uploads/2010/10/HRI_2008_COMPLETE_REPORT.pdf Last accessed: May 20th, 2011.

DARA (2010) *The Humanitarian Response Index 2010,* Madrid: DARA. Available at: http://daraint.org/wp-content/uploads/2010/10/Complete-report_HRI-2010.pdf Last accessed: May 20th, 2011.

Dartmouth Flood Observatory – DFO (2004) "September 2004 Bangladesh Flooding Report". Available at: http://www.dartmouth.edu/%7Efloods/ Last accessed: January 7th, 2011.

Development Assistance Committee – DAC (2007) *DAC Peer Review: Denmark*, Paris: OECD. Available at: http://www.oecd.org/dataoecd/46/35/39166375.pdf Last accessed: May 19th, 2011.

Development Assistance Committee – DAC (2009) *DAC Peer Review: Italy,* Paris: OECD. Available at: http://www.oecd.org/dataoecd/54/59/44403908.pdf Last accessed: March 15th, 2012.

Development Initiatives (2000) *Global Humanitarian Assistance 2000,* Geneva: United Nations Office for the Coordination of Humanitarian Affairs.

Denby, Kenneth (2008) "Burma Cyclone: Up to 50.000 Dead and Millions Homeless but Still No Call for Aid". London: Times. Available at: http://www.timesonline.co.uk/tol/news/world/asia/article3883123.ece Last accessed: January 11th, 2011.

Development Policy Forum (2008) *Is EU Development Aid Entering a New Era in the Wake of the Lisbon Treaty?,* Brussels: Friends of Europe. Available at: http://www.friendsofeurope.org/Portals/6/Documents/Reports/2008_DPF_LT_Report_EN_for_web.pdf Last accessed: September 13th, 2008.

DEVEX (2010) "Netherlands Plans Aid Budget Cut". Available at: http://www.devex.com/en/blogs/the-development-newswire/blogs_entries/netherlands-plans-aid-budget-cut Last accessed: April 5th, 2011.

Deutsch, Karl et al. (1957) *Political Community in the North Atlantic Area: International Organization in the Light of Historical Experience,* Princeton: Princeton University Press.

Disaster Emergency and Response Group – DER (2004) "Monsoon Floods 2004 – Post Floods Needs Assessment Summary Report". Available at: ttp://www.reliefweb.int/rw/RWFiles2004.nsf/FilesByRWDocUNIDFileName/JMAN-65FD4W-lcg-bang-6oct.pdf/$File/lcg-bang-6oct.pdf Last accessed: January 7th, 2001.

Directorate General for development Cooperation – DGCS (2008) "Yearly Report on Development Cooperation Policy to the Italian Parliament". Available at:

http://www.cooperazioneallosviluppo.esteri.it/pdgcs/italiano/Pubblicazioni/pdf/1_Rel.su2008_Parte_%20Gen..pdf Last accessed: March 25th, 2011.

Dutch Ministry of Foreign Affairs (2011) "HGIS factsheet 2011". Available at: http://www.minbuza.nl/dsresource?objectid=buzabeheer:183544&type=org Last accessed: April 4th, 2011.

Eberwein, Wolf-Dieter (2002) "The German Humanitarian System"*, Humanitarian Exchange Magazine,* Issue 20, March 2002, Berlin: ODI.

Eising, Rainer (2004) 'Multilevel Governance and Business Interests in the European Union'. *Governance: An International Journal of Policy, Administration and Institution,* 17(2): 211-245.

Erbring, Lutz; Goldenberg, E. & Miller, A. (1980) 'Front Page News and Real World Cues: A new Look at Agenda-Setting by the Media.' *American Journal of Political Science,* 24(1): 16-47.

European Commission (2000) *Cotonou Agreement,* Brussels: European Commission. Available at: http://ec.europa.eu/development/icenter/repository/agr01_en.pdf Last accessed: April 23rd, 2009.

European Commission (2006) *European Consensus on Development,* Joint statement of the European Council, the European Parliament and the European Commission, Brussels: European Commission. Available at: http://ec.europa.eu/development/icenter/repository/eu_consensus_en.pdf Last accessed: April 23rd, 2009.

European Commission (2007a) *European Development Policy – Annual Report 2007,* Brussels: European Commission. Available at: http://register.consilium.europa.eu/pdf/en/07/st11/st11141.en07.pdf Last accessed: April 23rd, 2009.

European Commission (2007b) *Non-State Actors (NSA) and Local Authorities (LA) Consultation in the Elaboration of the 10th EDF Country Strategy Papers in ACP Countries,* Brussels: European Commission. Available at: http://ec.europa.eu/development/icenter/repository/Consultation-non-state-Actor-and-local-Authorities-Public%20report_en.pdf Last accessed: April 23rd, 2009.

European Commission (2007c) *EU Code of Conduct on Division of Labour in Development Policy,* Brussels: European Commission. Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0072:FIN:EN:PDF Last accessed: April 23rd, 2009.

European Commission (2008) *European Development Policy – Annual Report 2008,* Brussels: European Commission. Available at: http://ec.europa.eu/europeaid/multimedia/publications/documents/annual-reports/europeaid_annual_report_2008_en.pdf Last accessed: April 23rd, 2009.

European Commission Humanitarian Office – ECHO (2009) "Annual Report". Available at: http://ec.europa.eu/echo/files/media/publications/annual_report/annual_report_2009_en.pdf#page=97 Last accessed: March 18th, 2011.

Federal Foreign Office of Germany (2008) "Twelve Basic Rules of Humanitarian Assistance Abroad", Berlin: German Foreign Ministry. Available at: http://www.goodhumanitariandonorship.org/Libraries/Meeting_Reports_Documents_2009-2010_Public/Funding_policy_for_Humanitarian_Aid_Projects_Federal_Foreign_Office.sflb.ashx Last accessed on January 6th, 2011.

Federal Ministry for Economic Cooperation and Development (2006) "Development-Oriented Emergency and Transitional Aid", Berlin: BMZ.

Federal Ministry for Economic Cooperation and Development (2008) "Disaster Risk Management – Contributions by German Development Cooperation", Berlin: BMZ.

GHK Consulting (2010) *Review of the International Humanitarian Rosters,* London: GHK. Available at: http://www.um.dk/NR/rdonlyres/75F7FBB2-DDE0-4DF4-A648-C15828DBC75F/0/ReviewofIHBashx.pdf Last accessed: May 20th, 2011.

Good Humanitarian Donorship – GHD (2011) "23 principles of Good Practice and Humanitarian Donorship". Available at: http://www.goodhumanitariandonorship.org/gns/principles-good-practice-ghd/overview.aspx Last accessed: April 8th, 2011.

Grosser, Alfred (1965) *French Foreign Policy Under de Gaulle*, Boston: Little, Brown, 1965.

Global Disaster Alert and Coordination System – GDACS (2011) "Red Earthquake Alert in Indonesia". Available at: http://www.gdacs.org/reports.asp?eventType=EQ&ID=18803&system=asgard&location=IDN&alertlevel=Red&glide_no=EQ-2006-000064-IDN Last accessed: January 11th, 2011.

GHA (2009) "GHA Report 2009". Wells: Development Initiatives. Available at: http://www.globalhumanitarianassistance.org/wp-content/uploads/2009/07/GHA-Report-2009.pdf Last accessed: March 6th, 2012.

Global Humanitarian Assistance – GHA (2011) "Global Humanitarian Assistance". Available at: http://www.globalhumanitarianassistance.org/ Last accessed: April 5th, 2011.

Haas, Ernst (1958) *The Uniting of Europe: Political, Social and Economic Forces 1950-1957,* Stanford: Stanford University Press.

Hayter, Theresa (1966) *French Aid*, London: Overseas Development Institute.

Hasegawa, Sukehiro (1975) *Japanese Foreign Aid: Policy and Practice*, New York: Praeger.

Held, David (1989) *Political Theory and the Modern State.* Stanford: Stanford University Press.

Hattori, Tomohisa (2003) 'The Moral Politics of Foreign Aid', *Review of International Studies* 29 (2): 229-247.

Humanitarian Emergency Response Review - HERR (2011) "Humanitarian Emergency Response Review". Available at: http://www.dfid.gov.uk/Documents/publications1/HERR.pdf?epslanguage=en Last accessed: April 8th, 2011.

HMG (2002) "International Development Act 2002". Available at: http://www.legislation.gov.uk/ukpga/2002/1/pdfs/ukpga_20020001_en.pdf Last accessed: April 8th, 2011.

HMG (2006) "International Development, Reporting and Transparency) Act 2006". Available at: http://www.legislation.gov.uk/ukpga/2006/31/pdfs/ukpga_20060031_en.pdf Last accessed: April 8th, 2011.

HM Treasury (2001) *Budget 2011,* London: The Stationary Office. Available at: http://cdn.hm-treasury.gov.uk/2011budget_complete.pdf Last accessed: March 14th, 2012.

Hook, Steven and Spanier, John (1998) *American Foreign Policy since World War II*, 14th ed., Washington, D.C.: CQ Press.

ICG (2001), *The European Humanitarian Aid Office (ECHO): Crisis Response in the Grey Lane*. Brussels: International Crisis Group.

India Meteorological Department – IMD (2007) "Tropical storm advisory N. 20 – Cyclone Sidr". Available at: http://www.imd.gov.in/section/nhac/dynamic/rsmc.htm Last accessed: January 11th, 2011.

India Meteorological Department – IMD (2008) "Cyclonic storm "NARGIS" over southwest and adjoining southeast and west central Bay of Bengal". Available at: http://www.imd.ernet.in/section/nhac/dynamic/cwind.htm Last accessed: January 11th, 2011.

Centre for the Research of the Epidemiology of Disasters (2010) "Emergency Events Database (EM-DAT)". Available at: http://www.emdat.be/database Last accessed on: January 10th, 2011.

International Federation of Red Cross And Red Crescent Societies - IFRC (2005) "Bangladesh: Floods Appeal No. 15/2004 Interim Final Report 26, July 2004- 30 June 2005". Available at: http://www.reliefweb.int/rw/rwb.nsf/db900SID/FPRI-6EWERD?OpenDocument. Last accessed: January 7th, 2011.

International Federation of Red Cross And Red Crescent Societies - IFRC (2005) "India: Maharashatra Monsoon Floods". Available at: http://www.ifrc.org/cgi/pdf_appeals.pl?rpts05/INfl09090511.pdf Last accessed: January 10th, 2011.

International Foundation for Electoral Systems – IFES (2010) "Election Guide Database". Available at: http://www.electionguide.org Last accessed: November 13th, 2011.

IOB (2006) *Dutch Humanitarian Assistance – An Evaluation*, Policy and Operations Evaluation Department, The Hague: Ministry of Foreign Affairs.

Jayasuriya, Sisira and Peter McCawley, (2010) *The Asian Tsunami: Aid and Reconstruction After a Disaster,* Cheltenham UK and Northampton MA USA: Edward Elgar.

Joint Tayphoon Warning Centre (2008) "Cyclone Nargis Warning Nr. 20". Available at: ftp://ftp.met.fsu.edu/pub/weather/tropical/GuamStuff/2008050209-WTIO.PGTW Last accessed: January 11th, 2011.

Karre, Bo and Svensson, Bengt (1989) 'The Determinants of Swedish Aid Policy', in Olav Stokke, ed., *Western Middle Powers and Global Poverty: The Determinants of the Aid Policies of Canada, Denmark, the Netherlands, Norway and Sweden* Uppsala, Sweden: Scandinavian Institute of African Studies: 231.

Katz, Richard (2001) 'Models of Democracy: Elite Attitudes and the Democratic Deficit in the European Union'. *European Union Politics* 2(1): 53-79.

Katzenstein, Peter (1976) 'International Relations and Domestic Structures: Foreign Economic Policies of Advanced Industrial States', *International Organization* 30: 1-45.

Kaviraj, Sadipta (2001) *Civil Society: History and Possibilities.* Cambridge: Cambridge University Press.

Kaviraj, Sadipta (2009) 'On State, Society and Discourse in India', *Institute of Development Studies* 21 (4): 10-15.

Keohane, Robert (1989) 'Neoliberal Institutionalism: A Perspective on World Politics' in Keohane, Robert (1989) *International Institutions and State Power.* Boulder: Westview.

Kean, John (1998) *Democracy and Civil Society.* London: University of Westminster Press.

Kean, John (2003) *Global Civil Society.* Cambridge: Cambridge University Press.

Kean, John (2009) *The Life and Death of Democracy.* Cammeray: Simon & Schuster.

Khan, Ashfaq, et al. (2007) "Acute Shortage of Drinking Water: Huge Health Crises Looms Large", Dakka: The Daily Star of Bangladesh. Available at: http://www.thedailystar.net/story.php?nid=12470 Last accessed: January 11th, 2011.

Kingdon, John (1984) *Agendas, Alternatives and Public Policies.* New York: Harper Collins.

Kitt, Florian (2010) *EU Aid Architecture: Recent Trends and Policy Directions.* Washington DC: The World Bank Group.

Kolodziej, Edward (1974) *French Foreign Policy Under de Gaulle and Pompidou: The Politics of Grandeur*, Ithaca, N.Y.: Cornell University Press.

Krasner, Stephen (1972) 'Are Bureaucracies Important?' *Foreign Policy* 7: 159-179.

Krasner, Stephen (1978) *Defending the National Interest: Raw Materials Investments and Foreign Policy,* Princeton: Princeton University Press.

Lennon, David (2001), 'The EU: A leader in Humanitarian and Development Assistance', in Robert J. Guttman (ed), *Europe in the New Century. Visions of an Emerging Superpower*, London: Lynne Rienner: 127-141.

Lim, Yon Soo, Barnett, George and Kim, Jang Hyun. (2006) 'The Structure of International Aid Flows and Global News Media'. Paper presented at the annual meeting of the International Communication Association, Dresden International Congress Centre, Dresden, Germany, Jun 16, 2006. Available at: http://www.allacademic.com/meta/p91563_index.html Last accessed: June 19th, 2009.

Lipset, Seymour Martin and Rokkan, Stein (1967) *Party Systems and Voter Alignments: Cross-National Perspectives.* New York: Free Press.

Lumsdaine, David (1993) *Moral Vision in International Politics.* Princeton, NJ: Princeton University Press.

Lumsdaine, David and Schopf, James (2007) 'Changing Values and the Recent Rise in Korean Development Assistance', *The Pacific Review* 20 (2): 221-255.

Macrae, Joanna et al. (2002), *Uncertain Power: The Changing Role of Official Donors in Humanitarian Action*, Humanitarian Policy Group Report 12, London: ODI.

MAE (2005) "Plan Director De La Cooperacion Espanola 2005-2008", Madrid: Ministerio de Asuntos Exteriores y Cooperación – Secretaria de Estado de Cooperación Internacional.

MAE (2009) "Plan Director De La Cooperacion Espanola 2005-2008", Madrid: Ministerio de Asuntos Exteriores y Cooperación – Secretaria de Estado de Cooperación Internacional.

Malik, Rajiv (2001) "To Rebuild Kutch", *Hinduism Today.* Available at: http://www.webcitation.org/5idsvd0I2 Last accessed: January 7th, 2011.

Maizels, Alfred and Nissanke, Machiko (1984) 'Motivations for Aid to Developing Countries', *World Development,* 879-900.

McCombs, Maxwell (1993) 'The Evolution of Agenda-Setting research: Twenty-Five Years in the Marketplace of Ideas.' *Journal of Communication,* 43(2): 58-67.

McCombs, Llamas, Lopez-Escobar and Rey (1997) 'Candidate Images in Spanish Elections: Second-Level Agenda-Setting Effects', *Journalism & Mass Communications Quarterly,* 74: 703-717.

Mearsheimer, John (2001) *The Tragedy of Great Power Politics.* New York: Norton.

Migdal, Joel (1988) *Strong Societies and Weak States: State-Society Relations and State Capability in the Third World.* Princeton: Princeton University Press.

Ministry of Foreign Affairs of Denmark (2008) *Peace and Stabilisation: Denmark's Policy Towards Fragile States 2010-2015,* Copenhagen: Ministry of Foreign Affairs of Denmark. Available at: http://www.um.dk/NR/rdonlyres/331C5FE7-A26C-46A4-8F24-11F8B386D2EA/0/Peaceandstabilisation.pdf Last accessed: May 19th, 2011.

Ministry of Foreign Affairs of Denmark (2010) *Priorities of the Danish Government for Danish Development Assistance: Overview of the Development Assistance Budget 2011 – 2015,* Copenhagen: Ministry of Foreign Affairs of Denmark.

Ministry of the Spanish Presidency (1998) "Ley 23/1998, de 7 de Julio, de Cooperación Internacional Para el Desarrollo". Availabe at: http://www.boe.es/aeboe/consultas/bases_datos/act.php?id=BOE-A-1998-16303 Last accessed: April 7th, 2011.

Moravcsik, Andrew (1993) 'Integrating International and Domestic Theories of International Bargaining' in Evans, Peter; Jacobson, Harold; Putnam Robert (eds.) (1993) *Double-Edged Diplomacy. International Bargaining and Domestic Politics.* Berkeley: University of California Press.

Moravcski, Andrew (1997) 'Taking Preferences Seriously. A Liberal theory of International Politics'. *International Organization* 51 (4): 514-553.

Moravcsik, Andrew (2002) 'In Defence of the "Democratic Deficit": Reassessing the Legitimacy of the European Union'. *Journal of Common Market Studies* 40(4): 603-624.

Morgenthau, Hans (1949) *Politics Among Nations: The Struggle for Power and Peace.* New York: Alfred A. Knopf.

Mowjee, Tasneem (1998), 'The European Community Humanitarian Office (ECHO): 1992-1999 and Beyond', *Disasters*, Vol. 22(3): 250-267.

Mowjee, Tasneem and Joanna Macrae (2002), *Accountability and Influence in the European Community Humanitarian Aid Office,* Humanitarian Policy Group Background Paper, London: ODI.

Nester, William (1992) *Japan and the Third World: Pattern, Power and Prospects*, New York: St. Martin's Press.

Nockerts, Regina and Van Arsdale, Peter (2008) 'A Theory of Obligation', *The Journal of Humanitarian Assistance.* Available at: file:///Users/matteogaravoglia/Desktop/Theory/Moral%20vision/A%20Theory%20of%20Obligation.webarchive Last accessed: February 27th, 2012.

Norris, Pippa (1999) *On Message. Communicating the Campaign.* London: Sage.

OECD (2001) 'Net Official Development Assistance Flows in 2000', Paris: OECD. Available at: http://www.oecd.org/dataoecd/50/37/1912521.pdf Last accessed: March 15th, 2012.

OECD (2009) 'Net Official Development Assistance in 2008', Paris: OECD. Available at: http://www.oecd.org/dataoecd/48/34/42459170.pdf Last accessed: March 15th, 2012.

OECD (2010) "Germany – Development Assistance Committee Peer Review 2010", Paris: Organisation for Economic Cooperation and Development.

Office for the Coordination of Humanitarian Affairs – OCHA (2005) "India: Maharashtra and Goa Floods OCHA Situation Report No. 1". Available at: http://www.reliefweb.int/rw/RWB.NSF/db900SID/EGUA-6EPPLN?OpenDocument Last accessed: January 10th, 2011.

Office for the Coordination of Humanitarian Affairs – OCHA (2011) "Central Emergency Response Fund". Available at: http://ochaonline.un.org/cerf/Donors/Donors2008/tabid/2897/Default.aspx Last accessed: April 6th, 2011.

Olsen, Gorm R. (2004), 'Changing European concerns: security and complex political emergencies instead of development', in Karin Arts and Anna K. Dickson (eds), *EU Development Cooperation: from Model to Symbol?*. Manchester: Manchester University Press: 80-100.

Overseas Development Institute – ODI (2010) 'Financing European Development Cooperation: the Financial Perspectives 2014-2020'. Available at: http://www.odi.org.uk/resources/details.asp?id=5078&title=european-development-cooperation-financial-perspectives Last accessed: March, 18th, 2011.

Pasch, Richard and Roberts, David (2006) "Hurricane Stan Tropical Cyclone Report". Available at: http://www.nhc.noaa.gov/pdf/TCR-AL202005_Stan.pdf Last accessed: January 10th, 2011.

Paulson, Tom (2005) "New Findings Super-Size Our Tsunami Threat." *Seattlepi.com.* February 7, 2005. Available at: http://www.seattlepi.com/local/211012_tsunamiscience07.html Last accessed: January 10th, 2011.

Pfetsch, Barbara, Adam, Silke and Eschner, Barbara (2008) 'The Contribution of the Press to Europeanization of Public Debates – A Comparative study of Issue salience and Conflict Lines of European Integration', *Journalism* 2008; 9; pp. 465-492.

Potter, David and Van Belle, Douglas (2004) 'News Media Coverage Influence on Japan's Foreign Aid Allocations', *Japanese Journal of Political Science* 5 (1): 113-135.

Pratt, Cranford (1990) ed., *Middle Power Internationalism: The North-South Dimension* (Montreal: McGill-Queen's University Press.

Putnam, Robert (1988) 'Diplomacy and Domestic Politics. The Logic of Two-Level Games'. *International Organization* 42: 427-460.

Rosenau, James (1969) *Linkage Politics: Essays on the Convergence of National and International Systems,* New York: Free Press.

Rosenau, James (1973) 'Theorizing Across Systems: Linkage Politics Revisited' in Jonathan Winkelfeld, ed., *Conflict Behavior and Linkage Politics,* New York: David McKay.

Rumford, Chris (2000) 'Civil Society of Transnational Social Space?', *European Journal of Social Theory* 6(1): 25-43.

Salamon, Lester (2002) 'The New Governance and the Tools of Public Action' in Salamon, Lester ed. (2002) *The Tools of Government: A Guide to the New Governance.* New York: Oxford University Press.

Scalapino, Robert (1992) 'The Foreign Policy of Modern Japan,' in Roy A. Macridis, ed., *Foreign Policy in World Politics*, 8th ed., Englewood Cliffs, N.J.: Prentice-Hall: 206.

Scappucci, Gioia (1998), *The Humanitarian Aid of the EU: 'Alibi', 'Smokescreen' or 'Solidarity in Action'? The response of the EU to the Humanitarian Disaster in Rwanda*, Brussels: European Interuniversity Press.

Schraeder, Peter ed. (1992), *Intervention into the 1990s: U.S. Foreign Policy in the Third World*, Boulder, Colo.: Lynne Rienner.

Schraeder, Peter, Steven Hook and Bruce Taylor (1998) 'Clarifying the Foreign Aid Puzzle: A Comparison of American, Japanese, French and Swedish Aid Flows', *World Politics,* 294-323.

SINA (2008) "Casualties of the Wenchuan Earthquake". Available at: http://news.sina.com.cn/pc/2008-05-13/326/651.html Last accessed: January 11th, 2011.

Skocpol, Theda (1979) *States and Social Revolutions: A Comparative Analysis of France, Russia and China.* New York: Cambridge University Press.

Snyder, Jack (1991) *Myths of Empire. Domestic Politics and International Ambition.* Ithaca: Cornell University Press.

Sorensen, Eva (2002) 'Democratic Theory and Network Governance', *Administrative Theory & Praxis* 24 (4): 693-720.

Stirling, John (1981) 'Japan and Asia: A 'Business Foreign Policy', *Asian Affairs* July-August: 354.

Stoker, Gerry (1998) 'Governance as Theory: Five Propositions', *International Social Science Journal* 50 (155): 17-28.

Torfing, Jacob (2005) 'Governance Network Theory: Towards a Second Generation', *European Political Science* 4: 305-315.

UNData (2011) *Net ODA as Percentage of OECD / DAC Donors GNI,* New York: UNDP. Available at: http://data.un.org/Data.aspx?d=MDG&f=seriesRowID%3A568 Last accessed: September 16th, 2011.

UNData (2011b) *Total Population, Both Sexes Combined (Thousands),* New York: UNDP. Available at: http://data.un.org/Data.aspx?q=Population&d=PopDiv&f=variableID%3a12 Last accessed: September 16th, 2011.

UNData (2011c) *Per Capita GDP at Current Prices – US Dollars,* New York: UNDP. Available at: http://data.un.org/Data.aspx?q=GDP+per+capita&d=SNAAMA&f=grID%3a101%3bcurrID%3aUSD%3bpcFlag%3a1 Last accessed: September 16th, 2011.

United Nations' Development Programme – UNDP (2008) *Human Development Report 2008,* New York: UNDP. Available at: http://hdr.undp.org/en/media/HDI_2008_EN_Tables.pdf Last accessed: September 16th, 2011.

United Nations Humanitarian Response Depot – UNHRD (2011) 'UNHRD Hub system', Available at: http://www.unhrd.org/new/?page_id=91 Last accessed: March 24th, 2011

United Nations Office for the Coordination of Humanitarian Affairs - OCHA (2009) *Central Emergency Response Fund (CERF) Contributions 2006-2009*. Available at: URL: http://ochaonline.un.org/cerf/Donors/Donors/tabid/5370/language/en-US/Default.aspx

United States Geological Survey's (USGS) National Earthquake Information Centre (2001) "Magnitude 7.7 INDIA 2001 January 26 03:16:40 UTC - Preliminary Earthquake Report". Available at: http://neic.usgs.gov/neis/eq_depot/2001/eq_010126/ Last accessed: January 7th, 2011.

United States Geological Survey's (USGS) National Earthquake Information Centre (2005) "Magnitude 7.6 Pakistan Earthquake". Available at:

http://earthquake.usgs.gov/earthquakes/eqinthenews/2005/usdyae/ Last accessed: January 10th, 2011.

United States Geological Survey's (USGS) National Earthquake Information Centre (2006) "Magnitude 6.3 earthquake – Java, Indonesia". Available at: http://earthquake.usgs.gov/earthquakes/eqinthenews/2006/usneb6/ Last accessed: January 11th, 2011.

United States Geological Survey's (USGS) National Earthquake Information Centre (2008) "Magnitude 7.9 Eastern Sichuan, China". Available at: http://earthquake.usgs.gov/earthquakes/eqinthenews/2008/us2008ryan/ Last accessed: January 11th, 2011.

United States Geological Survey's (USGS) National Earthquake Information Centre (2010) "South East Asian Tsunami 2004". Available at: www.usgs.gov Last accessed: January 10th, 2011.

Van Belle, Douglas (2003) 'Bureaucratic Responsiveness to the News Media: Comparing the Influence of the New York Times and Network Television News Coverage on US Foreign Aid Allocations', *Political Communication* 20 (3): 263-285.

Versluys, Helen and Orbie, Jan (2006), 'Theorizing EU Humanitarian Aid Policy', paper presented at the "Third Pan-European Conference on EU Politics", Istanbul: September 21st to 23rd, 2006. Available at: http://www.jhubc.it/ecpr-istanbul/virtualpaperroom/010.pdf Last accessed: February 2nd, 2012.

VVD-CDA (2010) "VVD-CDA Coalition Agreement 2010". Available at: http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2010/09/30/regeerakkoord-vvd-cda.html Last accessed: April 4th, 2011.

Walgrave, Stefaan and Van Aelst, Peter (2006) 'The Contingency of the Mass Media's Political Agenda Setting Power: Towards a Preliminary Theory', *Journal of Communication* 56: 88-109.

Wallington, Tabatha; Lawrence, Geoffrey; Loechel, Barton (2008) 'Reflections on the Legitimacy of Regional Environmental Governance: Lessons from Australia's

Experiment in natural Resource Management', *Journal of Environmental Policy & Planning* 10 (1): 1-30.

Waltz, Kenneth (1979) *Theory of International Politics.* New York: McGraw Hill.

Weaver, David (1977) 'Political Issues and Voters' Need for Orientation' in Shaw & McCombs (eds.) *The Emergence of American political Issues: The agenda-Setting Function of the Press,* New York: West.

West, Michael; Sanches, John J.; McNutt, Stephen R. (2005) "Periodically Triggered Seismicity at Mount Wrangell, Alaska, After the Sumatra Earthquake", *Science.* Vol. 308, No. 5725, 1144–1146. May 20, 2005.

Zucker, Harold (1978) 'The Variable Nature of News Media Influence' in B.D. Rubin (ed.) *Communication Yearbook:* 225-245. New Brunswick, NJ: Transaction Books.

## Appendices

### Appendix 1

Appendix 1 refers to the data analysis carried out for all countries combined in section 4.1.1. It presents the command that has been computed in order to obtain the multiple regression analysis, the regression itself and, finally, the table obtained in order to check for multicollinearity by computing for the tolerance value.

xtgls log_disburse dummy1 dummy2 dummy3 dummy4 dummy5 dummy6 gdpus catastropheday clgovernment election fatalities affected damage totarticles, i(catastropheday)

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =          1          Number of obs      =      1470
Estimated autocorrelations =          0          Number of groups   =        21
Estimated coefficients     =         15          Time periods       =        70
                                                 Wald chi2(14)      =    170.81
Log likelihood             =   323.9367          Prob > chi2        =    0.0000
```

| log_disburse | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| dummy1 | .3140768 | .0936561 | 3.35 | 0.001 | .1305142 | .4976394 |
| dummy2 | .21104 | .0765753 | 2.76 | 0.006 | .0609551 | .3611249 |
| dummy3 | .0289606 | .0294656 | 0.98 | 0.326 | -.028791 | .0867122 |
| dummy4 | .1155588 | .0590191 | 1.96 | 0.050 | -.0001166 | .2312342 |
| dummy5 | .3401364 | .1218558 | 2.79 | 0.005 | .1013035 | .5789693 |
| dummy6 | .2593412 | .0853094 | 3.04 | 0.002 | .0921378 | .4265447 |
| gdpus | -.4023916 | .1389613 | -2.90 | 0.004 | -.6747507 | -.1300325 |
| catastroph~y | -.0566921 | .0176792 | -3.21 | 0.001 | -.0913426 | -.0220416 |
| clgovernment | .009441 | .0155398 | 0.61 | 0.543 | -.0210165 | .0398984 |
| election | -.0252116 | .0344455 | -0.73 | 0.464 | -.0927236 | .0423003 |
| fatalities | .1639531 | .0228891 | 7.16 | 0.000 | .1190913 | .2088148 |
| affected | -.030683 | .0202764 | -1.51 | 0.130 | -.0704239 | .009058 |
| damage | .0229692 | .0233795 | 0.98 | 0.326 | -.0228538 | .0687921 |
| totarticles | .0004838 | .0406089 | 0.01 | 0.990 | -.0791082 | .0800757 |
| _cons | .082383 | .0386203 | 2.13 | 0.033 | .0066885 | .1580775 |

| Variable | VIF | 1/VIF |
|---|---|---|
| dummy5 | 70.93 | 0.014098 |
| gdpus | 58.34 | 0.017141 |
| dummy1 | 41.90 | 0.023866 |
| dummy6 | 34.77 | 0.028764 |
| dummy2 | 28.01 | 0.035700 |
| dummy4 | 16.64 | 0.060098 |
| dummy3 | 4.15 | 0.241110 |
| election | 3.20 | 0.312759 |
| clgovernment | 2.33 | 0.429428 |
| fatalities | 2.10 | 0.477191 |
| totarticles | 1.92 | 0.520005 |
| damage | 1.73 | 0.576631 |
| affected | 1.56 | 0.641416 |
| catastroph~y | 1.01 | 0.986382 |
| Mean VIF | 19.18 | |

Appendix 2

Appendix 2 refers to the data analysis carried out for the United Kingdom in section 4.2.1.1. It presents the command that has been computed in order to obtain the multiple regression analysis, the regression itself and, finally, the table obtained in order to check for multicollinearity by computing for the tolerance value.

xtgls log_disburse gdpus catastropheday clgovernment election fatalities affected damage totarticles, i(catastropheday)

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       210
Estimated autocorrelations =         0          Number of groups   =        21
Estimated coefficients     =         7          Time periods       =        10
                                                Wald chi2(6)       =     44.65
Log likelihood             = -19.30676          Prob > chi2        =    0.0000
```

| log_disburse | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| gdpus | -.4319799 | .4168515 | -1.04 | 0.300 | -1.248994 | .3850341 |
| catastroph~y | -.0648061 | .0639139 | -1.01 | 0.311 | -.190075 | .0604629 |
| clgovernment | (omitted) | | | | | |
| election | (omitted) | | | | | |
| fatalities | .2640017 | .0922759 | 2.86 | 0.004 | .0831441 | .4448592 |
| affected | -.0514753 | .0717139 | -0.72 | 0.473 | -.1920319 | .0890813 |
| damage | -.0055367 | .0832721 | -0.07 | 0.947 | -.168747 | .1576737 |
| totarticles | .2004247 | .15344 | 1.31 | 0.191 | -.1003122 | .5011616 |
| _cons | .3711198 | .2936078 | 1.26 | 0.206 | -.204341 | .9465806 |

| Variable | VIF | 1/VIF |
|---|---|---|
| fatalities | 2.61 | 0.383824 |
| totarticles | 2.39 | 0.417690 |
| damage | 1.68 | 0.594195 |
| affected | 1.49 | 0.670308 |
| gdpus | 1.24 | 0.806447 |
| catastroph~y | 1.01 | 0.986594 |
| Mean VIF | 1.74 | |

Appendix 3

Appendix 3 refers to the data analysis carried out for Italy in section 4.3.1.1. It presents the command that has been computed in order to obtain the multiple regression analysis, the regression itself and, finally, the table obtained in order to check for multicollinearity by computing for the tolerance value.

xtgls log_disburse gdpus catastropheday clgovernment election fatalities affected damage totarticles, i(catastropheday)

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       210
Estimated autocorrelations =         0          Number of groups   =        21
Estimated coefficients     =         9          Time periods       =        10
                                                Wald chi2(8)       =     11.80
Log likelihood             =  41.15029          Prob > chi2        =    0.1602
```

| log_disburse | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| gdpus | -.3545099 | .7536826 | -0.47 | 0.638 | -1.831701 | 1.122681 |
| catastroph~y | -.0697585 | .049968 | -1.40 | 0.163 | -.1676939 | .0281769 |
| clgovernment | -.0367229 | .0441972 | -0.83 | 0.406 | -.1233478 | .0499019 |
| election | -.0635151 | .1493037 | -0.43 | 0.671 | -.356145 | .2291147 |
| fatalities | .1001436 | .0676789 | 1.48 | 0.139 | -.0325046 | .2327919 |
| affected | -.093584 | .0603402 | -1.55 | 0.121 | -.2118486 | .0246806 |
| damage | .0604978 | .0731238 | 0.83 | 0.408 | -.0828221 | .2038178 |
| totarticles | -.2237557 | .1187452 | -1.88 | 0.060 | -.4564921 | .0089807 |
| _cons | .3464358 | .4831452 | 0.72 | 0.473 | -.6005114 | 1.293383 |

| Variable | VIF | 1/VIF |
|---|---|---|
| gdpus | 2.57 | 0.389776 |
| fatalities | 2.49 | 0.401184 |
| damage | 2.31 | 0.433264 |
| clgovernment | 2.29 | 0.437205 |
| totarticles | 2.13 | 0.470137 |
| affected | 1.88 | 0.532364 |
| election | 1.84 | 0.543346 |
| catastroph~y | 1.10 | 0.907584 |
| Mean VIF | 2.08 | |

Appendix 4

Appendix 4 refers to the data analysis carried out for the Netherlands in section 4.4.1.1. It presents the command that has been computed in order to obtain the multiple regression analysis, the regression itself and, finally, the table obtained in order to check for multicollinearity by computing for the tolerance value.

xtgls log_disburse gdpus catastropheday clgovernment election fatalities affected damage totarticles, i(catastropheday)

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       210
Estimated autocorrelations =         0          Number of groups   =        21
Estimated coefficients     =         9          Time periods       =        10
                                                Wald chi2(8)       =     44.24
Log likelihood             =  146.0986          Prob > chi2        =    0.0000
```

| log_disburse | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| gdpus | -2.682016 | .7744806 | -3.46 | 0.001 | -4.19997 | -1.164062 |
| catastroph~y | -.0185416 | .0288814 | -0.64 | 0.521 | -.0751482 | .0380649 |
| clgovernment | -.0364942 | .0385353 | -0.95 | 0.344 | -.112022 | .0390336 |
| election | -.0086672 | .0594983 | -0.15 | 0.884 | -.1252818 | .1079474 |
| fatalities | .2021999 | .0410059 | 4.93 | 0.000 | .1218299 | .2825699 |
| affected | -.0439939 | .0371657 | -1.18 | 0.237 | -.1168374 | .0288495 |
| damage | .0395538 | .0449407 | 0.88 | 0.379 | -.0485285 | .127636 |
| totarticles | -.2434429 | .0850843 | -2.86 | 0.004 | -.4102049 | -.0766808 |
| _cons | .5677191 | .1755524 | 3.23 | 0.001 | .2236426 | .9117955 |

| Variable | VIF | 1/VIF |
|---|---|---|
| gdpus | 2.75 | 0.364218 |
| fatalities | 2.49 | 0.402233 |
| totarticles | 2.39 | 0.417573 |
| damage | 2.37 | 0.422190 |
| affected | 1.94 | 0.516483 |
| clgovernment | 1.93 | 0.518875 |
| election | 1.15 | 0.870623 |
| catastroph~y | 1.00 | 0.999891 |
| Mean VIF | 2.00 | |

Appendix 5

Appendix 5 refers to the data analysis carried out for Spain in section 4.5.1.1. It presents the command that has been computed in order to obtain the multiple regression analysis, the regression itself and, finally, the table obtained in order to check for multicollinearity by computing for the tolerance value.

xtgls log_disburse gdpus catastropheday clgovernment election fatalities affected damage totarticles, i(catastropheday)

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       210
Estimated autocorrelations =         0          Number of groups   =        21
Estimated coefficients     =         9          Time periods       =        10
                                                Wald chi2(8)       =     14.26
Log likelihood             =  100.1759          Prob > chi2        =    0.0752
```

| log_disburse | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| gdpus | .4619103 | .346234 | 1.33 | 0.182 | -.2166958 | 1.140516 |
| catastroph~y | -.0875368 | .036534 | -2.40 | 0.017 | -.1591421 | -.0159315 |
| clgovernment | -.0864021 | .0549532 | -1.57 | 0.116 | -.1941083 | .0213042 |
| election | .0156899 | .075313 | 0.21 | 0.835 | -.1319209 | .1633007 |
| fatalities | .0451656 | .0481201 | 0.94 | 0.348 | -.049148 | .1394792 |
| affected | .0285093 | .0477545 | 0.60 | 0.551 | -.0650877 | .1221063 |
| damage | -.0240081 | .0549324 | -0.44 | 0.662 | -.1316736 | .0836574 |
| totarticles | .0943309 | .0831758 | 1.13 | 0.257 | -.0686906 | .2573525 |
| _cons | -.084326 | .1398243 | -0.60 | 0.546 | -.3583766 | .1897245 |

| Variable | VIF | 1/VIF |
|---|---|---|
| gdpus | 3.03 | 0.329676 |
| clgovernment | 2.53 | 0.395128 |
| damage | 2.29 | 0.437597 |
| fatalities | 2.21 | 0.452335 |
| totarticles | 2.21 | 0.453012 |
| affected | 2.06 | 0.484458 |
| election | 1.19 | 0.841478 |
| catastroph~y | 1.03 | 0.967695 |
| Mean VIF | 2.07 | |

Appendix 6

Appendix 6 refers to the data analysis carried out for Germany in section 4.6.1.1. It presents the command that has been computed in order to obtain the multiple regression analysis, the regression itself and, finally, the table obtained in order to check for multicollinearity by computing for the tolerance value.

xtgls log_disburse gdpus catastropheday clgovernment election fatalities affected damage totarticles, i(catastropheday)

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       210
Estimated autocorrelations =         0          Number of groups   =        21
Estimated coefficients     =         9          Time periods       =        10
                                                Wald chi2(8)       =     35.10
Log likelihood             =  51.65102          Prob > chi2        =    0.0000
```

| log_disburse | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| gdpus | -.1615516 | .4288302 | -0.38 | 0.706 | -1.002043 | .6789401 |
| catastroph~y | -.0865478 | .0453367 | -1.91 | 0.056 | -.175406 | .0023104 |
| clgovernment | .0658093 | .0562269 | 1.17 | 0.242 | -.0443934 | .1760119 |
| election | -.0591415 | .1006746 | -0.59 | 0.557 | -.2564601 | .138177 |
| fatalities | .1678711 | .0561768 | 2.99 | 0.003 | .0577665 | .2779757 |
| affected | -.0503184 | .0537484 | -0.94 | 0.349 | -.1556634 | .0550266 |
| damage | .0918535 | .0631214 | 1.46 | 0.146 | -.0318623 | .2155692 |
| totarticles | .0087572 | .113468 | 0.08 | 0.938 | -.213636 | .2311503 |
| _cons | .1947606 | .403388 | 0.48 | 0.629 | -.5958653 | .9853866 |

| Variable | VIF | 1/VIF |
|---|---|---|
| clgovernment | 4.45 | 0.224684 |
| gdpus | 4.23 | 0.236664 |
| damage | 1.90 | 0.526118 |
| fatalities | 1.90 | 0.526870 |
| totarticles | 1.65 | 0.604401 |
| affected | 1.65 | 0.607097 |
| election | 1.34 | 0.747564 |
| catastroph~y | 1.00 | 0.997559 |
| Mean VIF | 2.26 | |

Appendix 7

Appendix 7 refers to the data analysis carried out for France in section 4.7.1.1. It presents the command that has been computed in order to obtain the multiple regression analysis, the regression itself and, finally, the table obtained in order to check for multicollinearity by computing for the tolerance value.

xtgls log_disburse gdpus catastropheday clgovernment election fatalities affected damage totarticles, i(catastropheday)

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       210
Estimated autocorrelations =         0          Number of groups   =        23
Estimated coefficients     =         8          Obs per group: min =         1
                                                               avg =  9.130435
                                                               max =        10
                                                Wald chi2(7)       =     48.62
Log likelihood             =    53.603          Prob > chi2        =    0.0000
```

| log_disburse | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| gdpus | -1.505157 | .4779273 | -3.15 | 0.002 | -2.441877 | -.5684365 |
| catastroph~y | -.0517327 | .045594 | -1.13 | 0.257 | -.1410954 | .0376299 |
| clgovernment | -.1138497 | .0622061 | -1.83 | 0.067 | -.2357714 | .0080719 |
| election | (omitted) | | | | | |
| fatalities | .1776326 | .0642187 | 2.77 | 0.006 | .0517663 | .303499 |
| affected | -.0983254 | .0599796 | -1.64 | 0.101 | -.2158833 | .0192325 |
| damage | .1649869 | .0699357 | 2.36 | 0.018 | .0279154 | .3020584 |
| totarticles | .0021752 | .136897 | 0.02 | 0.987 | -.266138 | .2704885 |
| _cons | 1.050929 | .3302029 | 3.18 | 0.001 | .4037435 | 1.698115 |

| Variable | VIF | 1/VIF |
|---|---|---|
| gdpus | 2.84 | 0.352658 |
| fatalities | 2.53 | 0.395750 |
| totarticles | 2.47 | 0.404872 |
| damage | 2.38 | 0.420693 |
| affected | 2.09 | 0.478529 |
| clgovernment | 2.08 | 0.480495 |
| catastroph~y | 1.01 | 0.991531 |
| Mean VIF | 2.20 | |

Appendix 8

Appendix 8 refers to the data analysis carried out for Denmark in section 4.8.1.1. It presents the command that has been computed in order to obtain the multiple regression analysis, the regression itself and, finally, the table obtained in order to check for multicollinearity by computing for the tolerance value.

xtgls log_disburse gdpus catastropheday clgovernment election fatalities affected damage totarticles, i(catastropheday)

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       210
Estimated autocorrelations =         0          Number of groups   =        21
Estimated coefficients     =         9          Time periods       =        10
                                                Wald chi2(8)       =     24.83
Log likelihood             =  63.19996          Prob > chi2        =    0.0017
```

| log_disburse | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| gdpus | -9.912945 | 7.66385 | -1.29 | 0.196 | -24.93382 | 5.107925 |
| catastroph~y | -.0237402 | .0435088 | -0.55 | 0.585 | -.1090159 | .0615356 |
| clgovernment | -.0538394 | .0750526 | -0.72 | 0.473 | -.2009397 | .093261 |
| election | -.0617217 | .0875928 | -0.70 | 0.481 | -.2334005 | .109957 |
| fatalities | .1130308 | .0758974 | 1.49 | 0.136 | -.0357253 | .2617869 |
| affected | -.0649645 | .0590071 | -1.10 | 0.271 | -.1806164 | .0506873 |
| damage | .0209411 | .0698 | 0.30 | 0.764 | -.1158644 | .1577467 |
| totarticles | -.0535504 | .0837467 | -0.64 | 0.523 | -.217691 | .1105901 |
| _cons | .7409208 | .4639426 | 1.60 | 0.110 | -.16839 | 1.650232 |

| Variable | VIF | 1/VIF |
|---|---|---|
| gdpus | 4.78 | 0.209343 |
| election | 4.52 | 0.221169 |
| fatalities | 3.87 | 0.258581 |
| clgovernment | 3.32 | 0.301251 |
| damage | 2.59 | 0.385441 |
| affected | 2.22 | 0.451245 |
| totarticles | 1.83 | 0.545354 |
| catastroph~y | 1.03 | 0.970320 |
| Mean VIF | 3.02 | |

Appendix 9

Appendix 9 presents the data set used to investigate all countries combined.

The unit of analysis employed throughout the data set is the day.

List of acronyms and abbreviations:

d1: Dummy variable number 1
d2: Dummy variable number 2
d3: Dummy variable number 3
d4: Dummy variable number 4
d5: Dummy variable number 5
d6: Dummy variable number 6
gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation
catastropheday: Day of the catastrophe (number of days elapsed since the onset of a selected natural disaster)
clgovernment: Centre-left government (presence or not of centre-left parties in government of donor country under investigation)
election: Election (presence or not of an electoral period in the donor country under investigation)
fatalities: Fatalities (number of fatalities recorded for the natural disaster under investigation)
affected: Affected (number of affected people recorded for the natural disaster under investigation)
damage: Damage (estimated damages recorded for the natural disaster under investigation)
totarticles: Total number of articles (total number of articles recorded on the natural disaster under investigation)
log_disburse: Logarithmic disbursement (logarithmic disbursement of emergency humanitarian assistance recorded)

Appendix 9

| d1 | d2 | d3 | d4 | d5 | d6 | gdpus | catastropheday | clgovernment | election | fatalities | affected | damage | totarticles | log_disburse |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,047619048 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,095238095 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,078947 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,142857143 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,19047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,184211 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,238095238 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,131579 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,285714286 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,157895 | 0,995614 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,333333333 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,131579 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,380952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,131579 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,428571429 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,105263 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,476190476 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,523809524 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,571428571 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,052632 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,619047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,666666667 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,714285714 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,761904762 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,80952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,857142857 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,904761905 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 0,952380952 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,585513078 | 1 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,047619048 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,095238095 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,142857143 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,19047619 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,238095238 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,285714286 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,333333333 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,380952381 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,428571429 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,476190476 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,523809524 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,571428571 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,619047619 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,666666667 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,714285714 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,761904762 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,80952381 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,857142857 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,904761905 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,952380952 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 1 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,047619048 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0 | 0,945474 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,095238095 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,289474 | 0,90183 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,142857143 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,552632 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,19047619 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,552632 | 0,713293 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,238095238 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,473684 | 0,917499 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,285714286 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,789474 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,333333333 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,921053 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,380952381 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,428571429 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,736842 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,476190476 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,736842 | 0,992548 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,523809524 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,815789 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,571428571 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,894737 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,619047619 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,710526 | 0,954312 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,666666667 | 1 | 1 | 1 | 0,034835 | 0,117541 | 1 | 0,893082 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,714285714 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,761904762 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,526316 | 0,970681 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,80952381 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,578947 | 1 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,857142857 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,368421 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,904761905 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,473684 | 0,891906 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 0,952380952 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,289474 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,670355466 | 1 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,368421 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,047619048 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,095238095 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,142857143 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,19047619 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,238095238 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0,745189 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,285714286 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,052632 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,333333333 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,380952381 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,428571429 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,476190476 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,523809524 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,571428571 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,619047619 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,666666667 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,714285714 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,761904762 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,80952381 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,857142857 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,904761905 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,952380952 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 1 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,047619048 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,095238095 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,142857143 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,19047619 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,238095238 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,285714286 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,333333333 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,052632 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,380952381 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,428571429 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,476190476 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,131579 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,523809524 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,571428571 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,619047619 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,666666667 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,714285714 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,761904762 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,80952381 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,857142857 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,904761905 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,952380952 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,078947 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 1 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,131579 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,047619048 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0,91301 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,095238095 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,142857143 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,315789 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,19047619 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,263158 | 0,901099 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,238095238 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,210526 | 0,902245 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,285714286 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,157895 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,333333333 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,131579 | 0,776361 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,380952381 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,131579 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,428571429 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,476190476 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,523809524 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0,716802 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,571428571 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,078947 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,619047619 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,078947 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,666666667 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,078947 | 0,971415 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,714285714 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,105263 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,761904762 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,80952381 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,857142857 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,904761905 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 0,952380952 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,078947 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,69047619 | 1 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0,957741 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,047619048 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,095238095 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,142857143 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,210526 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,19047619 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,157895 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,238095238 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,285714286 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,026316 | 0,869428 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,333333333 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,380952381 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,428571429 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,476190476 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,523809524 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0,860257 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,571428571 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,619047619 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,666666667 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,714285714 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,761904762 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,80952381 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,857142857 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,904761905 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 0,952380952 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,722669349 | 1 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,047619048 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,095238095 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,142857143 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,19047619 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,238095238 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,078947 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,285714286 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,333333333 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,105263 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,380952381 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,428571429 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,052632 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,476190476 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,523809524 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,571428571 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,619047619 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,666666667 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,714285714 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,761904762 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,80952381 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,857142857 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,904761905 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 0,952380952 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752179745 | 1 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,047619048 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,095238095 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,142857143 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,19047619 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,078947 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,238095238 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,285714286 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,315789 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,333333333 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,380952381 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,342105 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,428571429 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,184211 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,476190476 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,523809524 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,210526 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,571428571 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,236842 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,619047619 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,131579 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,666666667 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,131579 | 0,994246 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,714285714 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,105263 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,761904762 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,131579 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,80952381 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,857142857 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,131579 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,904761905 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,078947 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,952380952 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,052632 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 1 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,052632 | 0,861243 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,047619048 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,095238095 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,184211 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,142857143 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,263158 | 0,894384 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,19047619 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,210526 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,238095238 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,157895 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,285714286 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,184211 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,333333333 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,380952381 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,157895 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,428571429 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,105263 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,476190476 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,078947 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,523809524 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,052632 | 0,905418 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,571428571 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,078947 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,619047619 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,078947 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,666666667 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,714285714 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,105263 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,761904762 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,052632 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,80952381 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,857142857 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,078947 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,904761905 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,026316 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 0,952380952 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,052632 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0,752850436 | 1 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,047619048 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,095238095 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,181818 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,142857143 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,136364 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,19047619 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,045455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,238095238 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,090909 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,285714286 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,090909 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,333333333 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,380952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,428571429 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,476190476 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,523809524 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,045455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,571428571 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,619047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,666666667 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,714285714 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,761904762 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,80952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,857142857 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,904761905 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 0,952380952 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,555331992 | 1 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,047619048 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,095238095 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,142857143 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,19047619 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,238095238 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,285714286 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,333333333 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,380952381 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,428571429 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,476190476 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,523809524 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,571428571 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,619047619 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,666666667 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,714285714 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,761904762 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,80952381 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,857142857 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,904761905 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,952380952 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 1 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,047619048 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,095238095 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,636364 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,142857143 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 1 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,19047619 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,977273 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,238095238 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,795455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,285714286 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,090909 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,333333333 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,380952381 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,727273 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,428571429 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,772727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,476190476 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,772727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,523809524 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,613636 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,571428571 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,681818 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,619047619 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,636364 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,666666667 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,477273 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,714285714 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,363636 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,761904762 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,181818 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,80952381 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,136364 | 1 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,857142857 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,159091 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,904761905 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,181818 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 0,952380952 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,090909 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,561703555 | 1 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,068182 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,047619048 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,095238095 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,142857143 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,19047619 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,238095238 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,285714286 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,333333333 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,380952381 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,428571429 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,476190476 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,523809524 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,571428571 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,619047619 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,666666667 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,714285714 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,761904762 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,80952381 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,857142857 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,904761905 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,952380952 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 1 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,047619048 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,095238095 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,142857143 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,19047619 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,238095238 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,285714286 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,333333333 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0,766855 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,380952381 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,428571429 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,476190476 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,523809524 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,571428571 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,619047619 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,666666667 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,714285714 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,761904762 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,80952381 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,857142857 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,904761905 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,952380952 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,045455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 1 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,047619048 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,095238095 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,068182 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,142857143 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,159091 | 0,929716 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,19047619 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,090909 | 0,824064 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,238095238 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,090909 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,285714286 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,333333333 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,022727 | 0,814609 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,380952381 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,428571429 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,476190476 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,523809524 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,571428571 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,619047619 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0,818536 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,666666667 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0,663166 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,714285714 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,761904762 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0,861175 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,80952381 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,045455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,857142857 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,904761905 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 0,952380952 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,577800134 | 1 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,047619048 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,095238095 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,113636 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,142857143 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,045455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,19047619 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0,747701 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,238095238 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,285714286 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,333333333 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,380952381 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,428571429 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,476190476 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,523809524 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,571428571 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,619047619 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,666666667 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,714285714 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,761904762 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,80952381 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,857142857 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,904761905 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 0,952380952 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,604963112 | 1 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,047619048 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,095238095 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,142857143 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,045455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,19047619 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,238095238 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,113636 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,285714286 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,333333333 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,380952381 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,428571429 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,476190476 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,523809524 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,571428571 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,619047619 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,666666667 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,714285714 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,761904762 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,80952381 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,857142857 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,904761905 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 0,952380952 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,630114017 | 1 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,047619048 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,095238095 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,142857143 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,19047619 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,068182 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,238095238 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,159091 | 0,834484 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,285714286 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,090909 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,333333333 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,090909 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,380952381 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,068182 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,428571429 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,045455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,476190476 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,068182 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,523809524 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,045455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,571428571 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,619047619 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,045455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,666666667 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,714285714 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,761904762 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,80952381 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,045455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,857142857 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0,933679 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,904761905 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,952380952 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 1 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,047619048 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,095238095 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,113636 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,142857143 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,090909 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,19047619 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,238095238 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0,887512 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,285714286 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,333333333 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,045455 | 0,887356 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,380952381 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,022727 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,428571429 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,045455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,476190476 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,523809524 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,571428571 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,619047619 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,666666667 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,714285714 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,045455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,761904762 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,80952381 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,045455 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,857142857 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,068182 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,904761905 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 0,952380952 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0,631455399 | 1 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,047619048 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,095238095 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,142857143 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,19047619 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,135135 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,238095238 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,108108 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,285714286 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,108108 | 0,891615 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,333333333 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,081081 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,380952381 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,428571429 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,135135 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,476190476 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,523809524 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,162162 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,571428571 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,619047619 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,666666667 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,714285714 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,081081 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,761904762 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,80952381 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,857142857 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,904761905 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 0,952380952 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,17739772 | 1 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,047619048 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,095238095 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,142857143 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,19047619 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,238095238 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,285714286 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,333333333 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,380952381 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,428571429 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,476190476 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,523809524 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,571428571 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,619047619 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,666666667 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,714285714 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,761904762 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,80952381 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,857142857 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,904761905 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,952380952 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 1 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,047619048 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0,640498 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,095238095 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,432432 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,142857143 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,378378 | 0,655144 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,19047619 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,459459 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,238095238 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,567568 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,285714286 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,351351 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,333333333 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 1 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,380952381 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,428571429 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,567568 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,476190476 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,621622 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,523809524 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,675676 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,571428571 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,648649 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,619047619 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,756757 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,666666667 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 1 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,714285714 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,761904762 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,351351 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,80952381 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,378378 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,857142857 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,432432 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,904761905 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,486486 | 0,792689 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 0,952380952 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,432432 | 0,738697 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,19047619 | 1 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,378378 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,047619048 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,095238095 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,142857143 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,19047619 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,238095238 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,285714286 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,333333333 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,380952381 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,428571429 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,027027 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,476190476 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,523809524 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,571428571 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,619047619 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,666666667 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,714285714 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,761904762 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,80952381 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,857142857 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,904761905 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,952380952 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 1 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,047619048 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,095238095 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,142857143 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,19047619 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,238095238 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,285714286 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,333333333 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,380952381 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,428571429 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,476190476 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,523809524 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,571428571 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,619047619 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,666666667 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,714285714 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,761904762 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,80952381 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,857142857 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,904761905 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,952380952 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,081081 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 1 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,047619048 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,095238095 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,142857143 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,27027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,19047619 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,216216 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,238095238 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,162162 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,285714286 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,333333333 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,081081 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,380952381 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,108108 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,428571429 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,476190476 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,523809524 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,571428571 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,081081 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,619047619 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,666666667 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,108108 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,714285714 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,216216 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,761904762 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,80952381 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,108108 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,857142857 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,904761905 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,243243 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 0,952380952 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,162162 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,200536553 | 1 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,108108 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,047619048 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,095238095 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,142857143 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,108108 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,19047619 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,108108 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,238095238 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,285714286 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,333333333 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,081081 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,380952381 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,216216 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,428571429 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,476190476 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,523809524 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,571428571 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,619047619 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,666666667 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,714285714 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,761904762 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,80952381 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,857142857 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,904761905 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 0,952380952 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,211602951 | 1 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,047619048 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,095238095 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,142857143 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,108108 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,19047619 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,238095238 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,285714286 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,333333333 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,380952381 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,428571429 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,476190476 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,523809524 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,571428571 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,619047619 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,666666667 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,714285714 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,761904762 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,80952381 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,857142857 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,904761905 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 0,952380952 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,224010731 | 1 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,047619048 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,095238095 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,142857143 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,19047619 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,081081 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,238095238 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,135135 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,285714286 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,189189 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,333333333 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,135135 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,380952381 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,135135 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,428571429 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,081081 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,476190476 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,523809524 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,571428571 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,081081 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,619047619 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,243243 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,666666667 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,135135 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,714285714 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,108108 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,761904762 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,135135 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,80952381 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,857142857 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,135135 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,904761905 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,108108 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,952380952 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,054054 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 1 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,047619048 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,095238095 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,081081 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,142857143 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,162162 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,19047619 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,135135 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,238095238 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,189189 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,285714286 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,333333333 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,380952381 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,108108 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,428571429 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,162162 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,476190476 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,523809524 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,027027 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,571428571 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,081081 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,619047619 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,135135 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,666666667 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,714285714 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,081081 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,761904762 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,80952381 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,857142857 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,054054 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,904761905 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,135135 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 0,952380952 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0,232729712 | 1 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,047619048 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,095238095 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,210526 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,142857143 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,19047619 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,238095238 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,285714286 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,210526 | 0,924306 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,333333333 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,105263 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,380952381 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,428571429 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,476190476 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,210526 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,523809524 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,263158 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,571428571 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,619047619 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,666666667 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,714285714 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,761904762 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,80952381 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,857142857 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,904761905 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 0,952380952 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,330315225 | 1 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,047619048 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,095238095 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,142857143 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,19047619 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,238095238 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,285714286 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,333333333 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,380952381 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,428571429 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,476190476 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,523809524 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,571428571 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,619047619 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,666666667 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,714285714 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,761904762 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,80952381 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,857142857 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,904761905 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,952380952 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 1 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,047619048 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,095238095 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,315789 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,142857143 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,473684 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,19047619 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,736842 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,238095238 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,578947 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,285714286 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,421053 | 0,817235 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,333333333 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,380952381 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,368421 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,428571429 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,526316 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,476190476 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 1 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,523809524 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,947368 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,571428571 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,631579 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,619047619 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,684211 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,666666667 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,421053 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,714285714 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,473684 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,761904762 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,421053 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,80952381 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,473684 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,857142857 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,526316 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,904761905 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,789474 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 0,952380952 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,368421 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,390342052 | 1 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,047619048 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,095238095 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,142857143 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,19047619 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,238095238 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,285714286 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,333333333 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,380952381 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,428571429 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,476190476 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,523809524 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,571428571 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,619047619 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,666666667 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,714285714 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,761904762 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,80952381 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,857142857 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,904761905 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,952380952 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 1 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,047619048 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,095238095 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,142857143 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,19047619 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,238095238 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,285714286 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,333333333 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,380952381 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,428571429 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,263158 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,476190476 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,210526 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,523809524 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,571428571 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,619047619 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,666666667 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,714285714 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,761904762 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,80952381 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,857142857 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,904761905 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,263158 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,952380952 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,263158 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 1 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,263158 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,047619048 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,095238095 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,368421 | 0,974429 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,142857143 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,526316 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,19047619 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,368421 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,238095238 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,285714286 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,333333333 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,210526 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,380952381 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,428571429 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,263158 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,476190476 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,523809524 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,315789 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,571428571 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,368421 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,619047619 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,210526 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,666666667 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,263158 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,714285714 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,761904762 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,80952381 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,857142857 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |

Appendix 9

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,904761905 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,315789 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 0,952380952 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,210526 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,416163649 | 1 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,047619048 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,095238095 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,526316 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,142857143 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,421053 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,19047619 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,263158 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,238095238 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,285714286 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,333333333 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,380952381 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,428571429 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,476190476 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,523809524 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,571428571 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,619047619 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,666666667 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,714285714 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,761904762 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,80952381 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,857142857 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,904761905 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 0,952380952 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,453051643 | 1 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,047619048 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,095238095 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,142857143 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,19047619 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,238095238 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,157895 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,285714286 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,333333333 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,380952381 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,428571429 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,476190476 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,523809524 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,571428571 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,619047619 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,666666667 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,714285714 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,761904762 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,80952381 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,857142857 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,904761905 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 0,952380952 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,492622401 | 1 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,047619048 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,095238095 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,142857143 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,19047619 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,238095238 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,315789 | 0,951388 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,285714286 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,578947 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,333333333 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,210526 | 0,910389 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,380952381 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,428571429 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,421053 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,476190476 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,523809524 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,315789 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,571428571 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,263158 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,619047619 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,210526 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,666666667 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,714285714 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,761904762 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,80952381 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,857142857 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,904761905 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,952380952 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 1 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,047619048 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,095238095 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,631579 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,142857143 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,263158 | 1 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,19047619 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,210526 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,238095238 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,210526 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,285714286 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,210526 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,333333333 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,380952381 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,428571429 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,476190476 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,523809524 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,210526 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,571428571 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,619047619 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,210526 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,666666667 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,714285714 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,761904762 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,157895 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,80952381 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,052632 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,857142857 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,904761905 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,105263 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 0,952380952 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0,497317237 | 1 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,052632 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,047619048 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,095238095 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,142857 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,142857143 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,19047619 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,285714 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,238095238 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,285714 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,285714286 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,380952 | 0,91809 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,333333333 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,238095 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,380952381 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,142857 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,428571429 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,190476 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,476190476 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,523809524 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,142857 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,571428571 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,619047619 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,666666667 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,714285714 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,761904762 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,80952381 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,857142857 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,904761905 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 0,952380952 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,794433266 | 1 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,047619048 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,095238095 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,142857143 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,19047619 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,238095238 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,285714286 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,333333333 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,380952381 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,428571429 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,476190476 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,523809524 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,571428571 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,619047619 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,666666667 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,714285714 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,761904762 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,80952381 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,857142857 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,904761905 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,952380952 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 1 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,047619048 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,095238095 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,190476 | 0,817278 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,142857143 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,19047619 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,380952 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,238095238 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,238095 | 0,842069 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,285714286 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,571429 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,333333333 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,380952381 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0,982683 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,428571429 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,285714 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,476190476 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 1 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,523809524 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,761905 | 1 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,571428571 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,428571 | 0,826023 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,619047619 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,714286 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,666666667 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,619048 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,714285714 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,761904762 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,52381 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,80952381 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,190476 | 0,815523 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,857142857 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,428571 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,904761905 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,238095 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 0,952380952 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,285714 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,868879946 | 1 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,333333 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,047619048 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,095238095 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,142857143 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,19047619 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,238095238 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,285714286 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,333333333 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,380952381 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,428571429 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,476190476 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,523809524 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,571428571 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,619047619 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,666666667 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,714285714 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,761904762 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,80952381 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,857142857 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,904761905 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,952380952 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 1 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,047619048 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,095238095 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,142857143 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,19047619 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,238095238 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,285714286 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,333333333 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,380952381 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,428571429 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,476190476 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,523809524 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,142857 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,571428571 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,619047619 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,666666667 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,714285714 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,761904762 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,80952381 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,857142857 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,904761905 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,952380952 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 1 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,047619048 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0,893526 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,095238095 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,142857143 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,333333 | 0,891938 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,19047619 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,238095 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,238095238 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,095238 | 0,512672 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,285714286 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,238095 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,333333333 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,380952381 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,428571429 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,476190476 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,523809524 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,142857 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,571428571 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,095238 | 0,731573 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,619047619 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,238095 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,666666667 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,380952 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,714285714 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,761904762 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,80952381 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,857142857 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,904761905 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 0,952380952 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,333333 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,905767941 | 1 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,142857 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,047619048 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,095238095 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,142857143 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,380952 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,19047619 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,238095 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,238095238 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,285714286 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,238095 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,333333333 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,380952381 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,428571429 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,476190476 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,523809524 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,571428571 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,142857 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,619047619 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,666666667 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,714285714 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,761904762 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,80952381 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,857142857 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,904761905 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 0,952380952 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,943661972 | 1 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,047619048 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,095238095 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,142857143 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,19047619 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,238095238 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,285714286 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,333333333 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,380952381 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,428571429 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,476190476 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,523809524 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,571428571 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,619047619 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,666666667 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,714285714 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,761904762 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,80952381 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,857142857 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,904761905 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 0,952380952 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0,985244802 | 1 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,047619048 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,095238095 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,142857143 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,19047619 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,238095238 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,190476 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,285714286 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,238095 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,333333333 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,380952381 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,333333 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,428571429 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,190476 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,476190476 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,523809524 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,571428571 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,142857 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,619047619 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,238095 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,666666667 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,285714 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,714285714 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,190476 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,761904762 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,142857 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,80952381 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,857142857 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,904761905 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,190476 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,952380952 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,047619048 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,095238095 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,238095 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,142857143 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,238095 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,19047619 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,190476 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,238095238 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,142857 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,285714286 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,333333333 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,142857 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,380952381 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,428571429 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,190476 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,476190476 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,523809524 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0,838553 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,571428571 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,047619 | 0,844894 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,619047619 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,142857 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,666666667 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,714285714 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,761904762 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,190476 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,80952381 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,857142857 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,047619 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,904761905 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0,952380952 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,095238 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,047619048 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,095238095 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,142857143 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,19047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,238095238 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,241379 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,285714286 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,103448 | 0,827749 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,333333333 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,172414 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,380952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,428571429 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,476190476 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,523809524 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,571428571 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,619047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,666666667 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,714285714 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,761904762 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,80952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,857142857 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,904761905 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 0,952380952 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,585513078 | 1 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,047619048 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,095238095 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,142857143 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,19047619 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,238095238 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,285714286 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,333333333 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,380952381 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,428571429 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,476190476 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,523809524 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,571428571 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,619047619 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,666666667 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,714285714 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,761904762 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,80952381 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,857142857 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,904761905 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,952380952 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 1 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,047619048 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0 | 0,918425 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,095238095 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,137931 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,142857143 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,275862 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,19047619 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,310345 | 0,902171 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,238095238 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,517241 | 0,844228 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,285714286 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,586207 | 0,844817 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,333333333 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,551724 | 1 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,380952381 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,275862 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,428571429 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,37931 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,476190476 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,62069 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,523809524 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,655172 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,571428571 | 0 | 1 | 1 | 0,034835 | 0,117541 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,619047619 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,758621 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,666666667 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,517241 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,714285714 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,517241 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,761904762 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,137931 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,80952381 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,448276 | 0,686471 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,857142857 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,517241 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,904761905 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,241379 | 0,91054 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 0,952380952 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,172414 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,622401073 | 1 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,344828 | 0,58782 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,047619048 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,095238095 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,142857143 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,19047619 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,238095238 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,285714286 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,333333333 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,380952381 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,428571429 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,476190476 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,523809524 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,571428571 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,619047619 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,666666667 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,714285714 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,761904762 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,80952381 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,857142857 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,904761905 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,952380952 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 1 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,047619048 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0,652673 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,095238095 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,142857143 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,19047619 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,238095238 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,285714286 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,333333333 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,380952381 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,428571429 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,476190476 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,523809524 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,571428571 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,619047619 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,666666667 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,714285714 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,761904762 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,80952381 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,857142857 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,904761905 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,952380952 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 1 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,047619048 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,095238095 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,142857143 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,172414 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,19047619 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,241379 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,238095238 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,172414 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,285714286 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,333333333 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,380952381 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,137931 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,428571429 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,476190476 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,523809524 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,571428571 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0,864417 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,619047619 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,666666667 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,714285714 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,761904762 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,80952381 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,857142857 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,904761905 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 0,952380952 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0,749415 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,654594232 | 1 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,047619048 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,095238095 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,142857143 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,19047619 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,206897 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,238095238 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,285714286 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,333333333 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,380952381 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,428571429 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,476190476 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,523809524 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,571428571 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,619047619 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,666666667 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,714285714 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,761904762 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,80952381 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,857142857 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,904761905 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 0,952380952 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,683433937 | 1 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,047619048 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,095238095 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,142857143 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,19047619 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,238095238 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,285714286 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,333333333 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,380952381 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,428571429 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,476190476 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,523809524 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,571428571 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,619047619 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,666666667 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,714285714 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,761904762 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,80952381 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,857142857 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,904761905 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 0,952380952 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 1 | 0,723004695 | 1 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,047619048 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,095238095 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,142857143 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,19047619 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,238095238 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,285714286 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,333333333 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,137931 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,380952381 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,241379 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,428571429 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,476190476 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,523809524 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,137931 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,571428571 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,137931 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,619047619 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,666666667 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,714285714 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,761904762 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,137931 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,80952381 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,857142857 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,904761905 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,952380952 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 1 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,047619048 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,095238095 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,142857143 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,310345 | 0,810865 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,19047619 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,206897 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,238095238 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,172414 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,285714286 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,275862 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,333333333 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,068966 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,380952381 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,103448 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,428571429 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,206897 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,476190476 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,137931 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,523809524 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,172414 | 0,770735 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,571428571 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,068966 | 0,608431 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,619047619 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,666666667 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,714285714 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,761904762 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,80952381 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,857142857 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,068966 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,722334004 | 0,904761905 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,739719813 | 0,557314063 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,034483 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0,740444743 | 0,557676305 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,047619048 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,095238095 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,272727 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,142857143 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,454545 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,19047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,545455 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,238095238 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,285714286 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,454545 | 0,951131 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,333333333 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,272727 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,380952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,363636 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,428571429 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,454545 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,476190476 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,523809524 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,571428571 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,619047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,666666667 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,714285714 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,090909 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,761904762 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,80952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,857142857 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,904761905 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 0,952380952 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,056673374 | 1 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,047619048 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,095238095 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,142857143 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,19047619 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,238095238 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,285714286 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,333333333 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,380952381 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,428571429 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,476190476 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,523809524 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,571428571 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,619047619 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,666666667 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,714285714 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,761904762 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,80952381 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,857142857 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,904761905 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,952380952 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 1 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,047619048 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0 | 0,652592 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,095238095 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,272727 | 0,767908 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,142857143 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,636364 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,19047619 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,363636 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,238095238 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,545455 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,285714286 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,272727 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,333333333 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,363636 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,380952381 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,636364 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,428571429 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,476190476 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,272727 | 0,971351 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,523809524 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,545455 | 0,988125 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,571428571 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,636364 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,619047619 | 0 | 0 | 1 | 0,034835 | 0,117541 | 1 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,666666667 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,545455 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,714285714 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,545455 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,761904762 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,545455 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,80952381 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,636364 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,857142857 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,818182 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,904761905 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,363636 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 0,952380952 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,454545 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,061368209 | 1 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,047619048 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,095238095 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,142857143 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,19047619 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,238095238 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,285714286 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,333333333 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,380952381 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,428571429 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,476190476 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,523809524 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,571428571 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,619047619 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,666666667 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,714285714 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,761904762 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,80952381 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,857142857 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,904761905 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,952380952 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 1 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,047619048 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,095238095 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,142857143 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,19047619 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,238095238 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,285714286 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,333333333 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,380952381 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,428571429 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,476190476 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,523809524 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,571428571 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,619047619 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,666666667 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0,841792 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,714285714 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,761904762 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,80952381 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,857142857 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,904761905 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,952380952 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 1 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,047619048 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,095238095 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,363636 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,142857143 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,727273 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,19047619 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,727273 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,238095238 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,363636 | 0,730403 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,285714286 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,363636 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,333333333 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,272727 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,380952381 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,272727 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,428571429 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,454545 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,476190476 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,272727 | 0,906898 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,523809524 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,272727 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,571428571 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,619047619 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,454545 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,666666667 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,714285714 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,545455 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,761904762 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,80952381 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,857142857 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,904761905 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 0,952380952 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,545455 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,063044936 | 1 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,047619048 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,095238095 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,545455 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,142857143 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,545455 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,19047619 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,363636 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,238095238 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,272727 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,285714286 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,333333333 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,380952381 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,428571429 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,476190476 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,523809524 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,571428571 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,619047619 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,666666667 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,714285714 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,761904762 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,80952381 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,857142857 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,904761905 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 0,952380952 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,066063045 | 1 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,047619048 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,095238095 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,142857143 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,19047619 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,238095238 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,285714286 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,333333333 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,380952381 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,428571429 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,476190476 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,523809524 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,571428571 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,619047619 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,666666667 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,714285714 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,761904762 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,80952381 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,857142857 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,904761905 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,952380952 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 1 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,047619048 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,095238095 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,142857143 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,19047619 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,238095238 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,285714286 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,333333333 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,380952381 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,272727 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,428571429 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,476190476 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,523809524 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,571428571 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,619047619 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,666666667 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,714285714 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,761904762 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,80952381 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,857142857 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,904761905 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,952380952 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 1 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0,998074 |

Appendix 9

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,047619048 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,095238095 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,454545 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,142857143 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,454545 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,19047619 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,454545 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,238095238 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,285714286 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,363636 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,333333333 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,380952381 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,272727 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,428571429 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,476190476 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,523809524 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,571428571 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,619047619 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,090909 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,666666667 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,272727 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,714285714 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,454545 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,761904762 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,272727 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,80952381 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,181818 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,857142857 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,904761905 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,363636 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 0,952380952 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,272727 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0,068075117 | 1 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,272727 | 0 |

Appendix 10

Appendix 10 presents the data set used to investigate the United Kingdom.

The unit of analysis employed throughout the data set is the day.

List of acronyms and abbreviations:

gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation
catastropheday: Day of the catastrophe (number of days elapsed since the onset of a selected natural disaster)
clgovernment: Centre-left government (presence or not of centre-left parties in government of donor country under investigation)
election: Election (presence or not of an electoral period in the donor country under investigation)
fatalities: Fatalities (number of fatalities recorded for the natural disaster under investigation)
affected: Affected (number of affected people recorded for the natural disaster under investigation)
damage: Damage (estimated damages recorded for the natural disaster under investigation)
totarticles: Total number of articles (total number of articles recorded on the natural disaster under investigation)
log_disburse: Logarithmic disbursement (logarithmic disbursement of emergency humanitarian assistance recorded)

Appendix 10

| gdpus | catastropheday | clgovernment | election | fatalities | affected | damage | totarticles | log_disburse |
|---|---|---|---|---|---|---|---|---|
| 0,585513078 | 0,047619048 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 0,095238095 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,078947 | 0 |
| 0,585513078 | 0,142857143 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 0,19047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,184211 | 0 |
| 0,585513078 | 0,238095238 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,131579 | 0 |
| 0,585513078 | 0,285714286 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,157895 | 0,995614 |
| 0,585513078 | 0,333333333 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,131579 | 0 |
| 0,585513078 | 0,380952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,131579 | 0 |
| 0,585513078 | 0,428571429 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,105263 | 0 |
| 0,585513078 | 0,476190476 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 0,523809524 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,026316 | 0 |
| 0,585513078 | 0,571428571 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,052632 | 0 |
| 0,585513078 | 0,619047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 0,666666667 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,026316 | 0 |
| 0,585513078 | 0,714285714 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 0,761904762 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 0,80952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 0,857142857 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,026316 | 0 |
| 0,585513078 | 0,904761905 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 0,952380952 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 1 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,670355466 | 0,047619048 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,095238095 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,142857143 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,19047619 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,238095238 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,285714286 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,333333333 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |

Appendix 10

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,670355466 | 0,380952381 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,428571429 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,476190476 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,523809524 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,571428571 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0,026316 | 0 |
| 0,670355466 | 0,619047619 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,666666667 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,714285714 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,761904762 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,80952381 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,857142857 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,904761905 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,952380952 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 1 | 1 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,670355466 | 0,047619048 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0 | 0,945474 |
| 0,670355466 | 0,095238095 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,289474 | 0,90183 |
| 0,670355466 | 0,142857143 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,552632 | 0 |
| 0,670355466 | 0,19047619 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,552632 | 0,713293 |
| 0,670355466 | 0,238095238 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,473684 | 0,917499 |
| 0,670355466 | 0,285714286 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,789474 | 0 |
| 0,670355466 | 0,333333333 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,921053 | 0 |
| 0,670355466 | 0,380952381 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0,670355466 | 0,428571429 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,736842 | 0 |
| 0,670355466 | 0,476190476 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,736842 | 0,992548 |
| 0,670355466 | 0,523809524 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,815789 | 0 |
| 0,670355466 | 0,571428571 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,894737 | 0 |
| 0,670355466 | 0,619047619 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,710526 | 0,954312 |
| 0,670355466 | 0,666666667 | 1 | 1 | 1 | 0,034835 | 0,117541 | 1 | 0,893082 |
| 0,670355466 | 0,714285714 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0 | 0 |

Appendix 10

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,670355466 | 0,761904762 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,526316 | 0,970681 |
| 0,670355466 | 0,80952381 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,578947 | 1 |
| 0,670355466 | 0,857142857 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,368421 | 0 |
| 0,670355466 | 0,904761905 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,473684 | 0,891906 |
| 0,670355466 | 0,952380952 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,289474 | 0 |
| 0,670355466 | 1 | 1 | 1 | 1 | 0,034835 | 0,117541 | 0,368421 | 0 |
| 0,69047619 | 0,047619048 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,095238095 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,142857143 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,19047619 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,238095238 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0,745189 |
| 0,69047619 | 0,285714286 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,052632 | 0 |
| 0,69047619 | 0,333333333 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,380952381 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,428571429 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,476190476 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,523809524 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,571428571 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,619047619 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,666666667 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,714285714 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,761904762 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,80952381 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,857142857 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,904761905 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,952380952 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 1 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,69047619 | 0,047619048 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,026316 | 0 |
| 0,69047619 | 0,095238095 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |

Appendix 10

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,69047619 | 0,142857143 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,69047619 | 0,19047619 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,69047619 | 0,238095238 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,69047619 | 0,285714286 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,026316 | 0 |
| 0,69047619 | 0,333333333 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,052632 | 0 |
| 0,69047619 | 0,380952381 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,69047619 | 0,428571429 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,69047619 | 0,476190476 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,131579 | 0 |
| 0,69047619 | 0,523809524 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,026316 | 0 |
| 0,69047619 | 0,571428571 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,69047619 | 0,619047619 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,69047619 | 0,666666667 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,026316 | 0 |
| 0,69047619 | 0,714285714 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,69047619 | 0,761904762 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,69047619 | 0,80952381 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,69047619 | 0,857142857 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,69047619 | 0,904761905 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,026316 | 0 |
| 0,69047619 | 0,952380952 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,078947 | 0 |
| 0,69047619 | 1 | 1 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,131579 | 0 |
| 0,69047619 | 0,047619048 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0,91301 |
| 0,69047619 | 0,095238095 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,69047619 | 0,142857143 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,315789 | 0 |
| 0,69047619 | 0,19047619 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,263158 | 0,901099 |
| 0,69047619 | 0,238095238 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,210526 | 0,902245 |
| 0,69047619 | 0,285714286 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,157895 | 0 |
| 0,69047619 | 0,333333333 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,131579 | 0,776361 |
| 0,69047619 | 0,380952381 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,131579 | 0 |
| 0,69047619 | 0,428571429 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,69047619 | 0,476190476 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |

Appendix 10

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,69047619 | 0,523809524 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0,716802 |
| 0,69047619 | 0,571428571 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,078947 | 0 |
| 0,69047619 | 0,619047619 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,078947 | 0 |
| 0,69047619 | 0,666666667 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,078947 | 0,971415 |
| 0,69047619 | 0,714285714 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,105263 | 0 |
| 0,69047619 | 0,761904762 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,69047619 | 0,80952381 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |
| 0,69047619 | 0,857142857 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |
| 0,69047619 | 0,904761905 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |
| 0,69047619 | 0,952380952 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,078947 | 0 |
| 0,69047619 | 1 | 1 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0,957741 |
| 0,722669349 | 0,047619048 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 0,095238095 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 0,142857143 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,210526 | 0 |
| 0,722669349 | 0,19047619 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,157895 | 0 |
| 0,722669349 | 0,238095238 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 0,722669349 | 0,285714286 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,026316 | 0,869428 |
| 0,722669349 | 0,333333333 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 0,380952381 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 0,428571429 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 0,476190476 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 0,523809524 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0,860257 |
| 0,722669349 | 0,571428571 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 0,619047619 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 0,666666667 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 0,714285714 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 0,761904762 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 0,80952381 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 0,857142857 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |

Appendix 10

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,722669349 | 0,904761905 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 0,952380952 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,722669349 | 1 | 1 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,752179745 | 0,047619048 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752179745 | 0,095238095 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,026316 | 0 |
| 0,752179745 | 0,142857143 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,026316 | 0 |
| 0,752179745 | 0,19047619 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752179745 | 0,238095238 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,078947 | 0 |
| 0,752179745 | 0,285714286 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752179745 | 0,333333333 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,105263 | 0 |
| 0,752179745 | 0,380952381 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752179745 | 0,428571429 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,052632 | 0 |
| 0,752179745 | 0,476190476 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,026316 | 0 |
| 0,752179745 | 0,523809524 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752179745 | 0,571428571 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,026316 | 0 |
| 0,752179745 | 0,619047619 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752179745 | 0,666666667 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752179745 | 0,714285714 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752179745 | 0,761904762 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752179745 | 0,80952381 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752179745 | 0,857142857 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752179745 | 0,904761905 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752179745 | 0,952380952 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752179745 | 1 | 1 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,752850436 | 0,047619048 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,752850436 | 0,095238095 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,752850436 | 0,142857143 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,752850436 | 0,19047619 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,078947 | 0 |
| 0,752850436 | 0,238095238 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |

Appendix 10

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,752850436 | 0,285714286 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,315789 | 0 |
| 0,752850436 | 0,333333333 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0,752850436 | 0,380952381 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,342105 | 0 |
| 0,752850436 | 0,428571429 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,184211 | 0 |
| 0,752850436 | 0,476190476 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,752850436 | 0,523809524 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,210526 | 0 |
| 0,752850436 | 0,571428571 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,236842 | 0 |
| 0,752850436 | 0,619047619 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,131579 | 0 |
| 0,752850436 | 0,666666667 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,131579 | 0,994246 |
| 0,752850436 | 0,714285714 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,105263 | 0 |
| 0,752850436 | 0,761904762 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,131579 | 0 |
| 0,752850436 | 0,80952381 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,752850436 | 0,857142857 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,131579 | 0 |
| 0,752850436 | 0,904761905 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,078947 | 0 |
| 0,752850436 | 0,952380952 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,052632 | 0 |
| 0,752850436 | 1 | 1 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,052632 | 0,861243 |
| 0,752850436 | 0,047619048 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,752850436 | 0,095238095 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,184211 | 0 |
| 0,752850436 | 0,142857143 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,263158 | 0,894384 |
| 0,752850436 | 0,19047619 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,210526 | 0 |
| 0,752850436 | 0,238095238 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,157895 | 0 |
| 0,752850436 | 0,285714286 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,184211 | 0 |
| 0,752850436 | 0,333333333 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,752850436 | 0,380952381 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,157895 | 0 |
| 0,752850436 | 0,428571429 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,105263 | 0 |
| 0,752850436 | 0,476190476 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,078947 | 0 |
| 0,752850436 | 0,523809524 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,052632 | 0,905418 |
| 0,752850436 | 0,571428571 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,078947 | 0 |
| 0,752850436 | 0,619047619 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,078947 | 0 |

Appendix 10

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,752850436 | 0,666666667 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,752850436 | 0,714285714 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,105263 | 0 |
| 0,752850436 | 0,761904762 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,052632 | 0 |
| 0,752850436 | 0,80952381 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,752850436 | 0,857142857 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,078947 | 0 |
| 0,752850436 | 0,904761905 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,026316 | 0 |
| 0,752850436 | 0,952380952 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0,052632 | 0 |
| 0,752850436 | 1 | 1 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |

## Appendix 11

Appendix 11 presents the data set used to investigate Italy.

The unit of analysis employed throughout the data set is the day.

List of acronyms and abbreviations:

gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation
catastropheday: Day of the catastrophe (number of days elapsed since the onset of a selected natural disaster)
clgovernment: Centre-left government (presence or not of centre-left parties in government of donor country under investigation)
election: Election (presence or not of an electoral period in the donor country under investigation)
fatalities: Fatalities (number of fatalities recorded for the natural disaster under investigation)
affected: Affected (number of affected people recorded for the natural disaster under investigation)
damage: Damage (estimated damages recorded for the natural disaster under investigation)
totarticles: Total number of articles (total number of articles recorded on the natural disaster under investigation)
log_disburse: Logarithmic disbursement (logarithmic disbursement of emergency humanitarian assistance recorded)

Appendix 11

| gdpus | catastropheday | clgovernment | election | fatalities | affected | damage | totarticles | log_disburse |
|---|---|---|---|---|---|---|---|---|
| 0,555331992 | 0,047619048 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,555331992 | 0,095238095 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,181818 | 0 |
| 0,555331992 | 0,142857143 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,136364 | 0 |
| 0,555331992 | 0,19047619 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,045455 | 0 |
| 0,555331992 | 0,238095238 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,090909 | 0 |
| 0,555331992 | 0,285714286 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,090909 | 0 |
| 0,555331992 | 0,333333333 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,022727 | 0 |
| 0,555331992 | 0,380952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,022727 | 0 |
| 0,555331992 | 0,428571429 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,022727 | 0 |
| 0,555331992 | 0,476190476 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,022727 | 0 |
| 0,555331992 | 0,523809524 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,045455 | 0 |
| 0,555331992 | 0,571428571 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,022727 | 0 |
| 0,555331992 | 0,619047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,555331992 | 0,666666667 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,555331992 | 0,714285714 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,555331992 | 0,761904762 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,555331992 | 0,80952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,555331992 | 0,857142857 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,555331992 | 0,904761905 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,555331992 | 0,952380952 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,555331992 | 1 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,561703555 | 0,047619048 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,095238095 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,142857143 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,19047619 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,238095238 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,285714286 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,333333333 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |

Appendix 11

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,561703555 | 0,380952381 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,428571429 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,476190476 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,523809524 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,571428571 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,619047619 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,666666667 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,714285714 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,761904762 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,80952381 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,857142857 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,904761905 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,952380952 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 1 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,561703555 | 0,047619048 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0,561703555 | 0,095238095 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,636364 | 0 |
| 0,561703555 | 0,142857143 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 1 | 0 |
| 0,561703555 | 0,19047619 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,977273 | 0 |
| 0,561703555 | 0,238095238 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,795455 | 0 |
| 0,561703555 | 0,285714286 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,090909 | 0 |
| 0,561703555 | 0,333333333 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0,561703555 | 0,380952381 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,727273 | 0 |
| 0,561703555 | 0,428571429 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,772727 | 0 |
| 0,561703555 | 0,476190476 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,772727 | 0 |
| 0,561703555 | 0,523809524 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,613636 | 0 |
| 0,561703555 | 0,571428571 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,681818 | 0 |
| 0,561703555 | 0,619047619 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,636364 | 0 |
| 0,561703555 | 0,666666667 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,477273 | 0 |
| 0,561703555 | 0,714285714 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,363636 | 0 |

Appendix 11

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,561703555 | 0,761904762 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,181818 | 0 |
| 0,561703555 | 0,80952381 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,136364 | 1 |
| 0,561703555 | 0,857142857 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,159091 | 0 |
| 0,561703555 | 0,904761905 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,181818 | 0 |
| 0,561703555 | 0,952380952 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,090909 | 0 |
| 0,561703555 | 1 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,068182 | 0 |
| 0,577800134 | 0,047619048 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,095238095 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,142857143 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,19047619 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,238095238 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,285714286 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0,022727 | 0 |
| 0,577800134 | 0,333333333 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0,022727 | 0 |
| 0,577800134 | 0,380952381 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,428571429 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,476190476 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,523809524 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,571428571 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,619047619 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,666666667 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,714285714 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,761904762 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,80952381 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,857142857 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,904761905 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,952380952 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 1 | 0 | 0,5 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,577800134 | 0,047619048 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,577800134 | 0,095238095 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |

Appendix 11

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,577800134 | 0,142857143 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,577800134 | 0,19047619 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,577800134 | 0,238095238 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,577800134 | 0,285714286 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,577800134 | 0,333333333 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0,766855 |
| 0,577800134 | 0,380952381 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,022727 | 0 |
| 0,577800134 | 0,428571429 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,022727 | 0 |
| 0,577800134 | 0,476190476 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,022727 | 0 |
| 0,577800134 | 0,523809524 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,577800134 | 0,571428571 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,022727 | 0 |
| 0,577800134 | 0,619047619 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,577800134 | 0,666666667 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,577800134 | 0,714285714 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,577800134 | 0,761904762 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,577800134 | 0,80952381 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,022727 | 0 |
| 0,577800134 | 0,857142857 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,577800134 | 0,904761905 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,577800134 | 0,952380952 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,045455 | 0 |
| 0,577800134 | 1 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,022727 | 0 |
| 0,577800134 | 0,047619048 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,577800134 | 0,095238095 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,068182 | 0 |
| 0,577800134 | 0,142857143 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,159091 | 0,929716 |
| 0,577800134 | 0,19047619 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,090909 | 0,824064 |
| 0,577800134 | 0,238095238 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,090909 | 0 |
| 0,577800134 | 0,285714286 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,022727 | 0 |
| 0,577800134 | 0,333333333 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,022727 | 0,814609 |
| 0,577800134 | 0,380952381 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,022727 | 0 |
| 0,577800134 | 0,428571429 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,022727 | 0 |
| 0,577800134 | 0,476190476 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |

Appendix 11

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,577800134 | 0,523809524 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,577800134 | 0,571428571 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,577800134 | 0,619047619 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0,818536 |
| 0,577800134 | 0,666666667 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0,663166 |
| 0,577800134 | 0,714285714 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,577800134 | 0,761904762 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0,861175 |
| 0,577800134 | 0,80952381 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,045455 | 0 |
| 0,577800134 | 0,857142857 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,577800134 | 0,904761905 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,577800134 | 0,952380952 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,577800134 | 1 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,604963112 | 0,047619048 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,095238095 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,113636 | 0 |
| 0,604963112 | 0,142857143 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,045455 | 0 |
| 0,604963112 | 0,19047619 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0,747701 |
| 0,604963112 | 0,238095238 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,285714286 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,333333333 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,380952381 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,022727 | 0 |
| 0,604963112 | 0,428571429 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,476190476 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,523809524 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,571428571 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,619047619 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,666666667 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,714285714 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,761904762 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,80952381 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,857142857 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |

Appendix 11

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,604963112 | 0,904761905 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 0,952380952 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,604963112 | 1 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,630114017 | 0,047619048 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,095238095 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,142857143 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,045455 | 0 |
| 0,630114017 | 0,19047619 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,022727 | 0 |
| 0,630114017 | 0,238095238 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,113636 | 0 |
| 0,630114017 | 0,285714286 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,333333333 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,380952381 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,022727 | 0 |
| 0,630114017 | 0,428571429 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,476190476 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,523809524 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,022727 | 0 |
| 0,630114017 | 0,571428571 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,619047619 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,666666667 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,714285714 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,761904762 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,80952381 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,857142857 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,904761905 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 0,952380952 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,630114017 | 1 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,631455399 | 0,047619048 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,631455399 | 0,095238095 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,631455399 | 0,142857143 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,631455399 | 0,19047619 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,068182 | 0 |
| 0,631455399 | 0,238095238 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,159091 | 0,834484 |

Appendix 11

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,631455399 | 0,285714286 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,090909 | 0 |
| 0,631455399 | 0,333333333 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,090909 | 0 |
| 0,631455399 | 0,380952381 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,068182 | 0 |
| 0,631455399 | 0,428571429 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,045455 | 0 |
| 0,631455399 | 0,476190476 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,068182 | 0 |
| 0,631455399 | 0,523809524 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,045455 | 0 |
| 0,631455399 | 0,571428571 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,022727 | 0 |
| 0,631455399 | 0,619047619 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,045455 | 0 |
| 0,631455399 | 0,666666667 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,631455399 | 0,714285714 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,022727 | 0 |
| 0,631455399 | 0,761904762 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,022727 | 0 |
| 0,631455399 | 0,80952381 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,045455 | 0 |
| 0,631455399 | 0,857142857 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0,933679 |
| 0,631455399 | 0,904761905 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,631455399 | 0,952380952 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,631455399 | 1 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,631455399 | 0,047619048 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,631455399 | 0,095238095 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,113636 | 0 |
| 0,631455399 | 0,142857143 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,090909 | 0 |
| 0,631455399 | 0,19047619 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,022727 | 0 |
| 0,631455399 | 0,238095238 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0,887512 |
| 0,631455399 | 0,285714286 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,631455399 | 0,333333333 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,045455 | 0,887356 |
| 0,631455399 | 0,380952381 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,022727 | 0 |
| 0,631455399 | 0,428571429 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,045455 | 0 |
| 0,631455399 | 0,476190476 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,631455399 | 0,523809524 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,631455399 | 0,571428571 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,631455399 | 0,619047619 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |

Appendix 11

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,631455399 | 0,666666667 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,631455399 | 0,714285714 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,045455 | 0 |
| 0,631455399 | 0,761904762 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,631455399 | 0,80952381 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,045455 | 0 |
| 0,631455399 | 0,857142857 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,068182 | 0 |
| 0,631455399 | 0,904761905 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,631455399 | 0,952380952 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,631455399 | 1 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |

Appendix 12

Appendix 12 presents the data set used to investigate the Netherlands.

The unit of analysis employed throughout the data set is the day.

List of acronyms and abbreviations:

gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation
catastropheday: Day of the catastrophe (number of days elapsed since the onset of a selected natural disaster)
clgovernment: Centre-left government (presence or not of centre-left parties in government of donor country under investigation)
election: Election (presence or not of an electoral period in the donor country under investigation)
fatalities: Fatalities (number of fatalities recorded for the natural disaster under investigation)
affected: Affected (number of affected people recorded for the natural disaster under investigation)
damage: Damage (estimated damages recorded for the natural disaster under investigation)
totarticles: Total number of articles (total number of articles recorded on the natural disaster under investigation)
log_disburse: Logarithmic disbursement (logarithmic disbursement of emergency humanitarian assistance recorded)

Appendix 12

| gdpus | catastropheday | clgovernment | election | fatalities | affected | damage | totarticles | log_disburse |
|---|---|---|---|---|---|---|---|---|
| 0,17739772 | 0,047619048 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |
| 0,17739772 | 0,095238095 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,054054 | 0 |
| 0,17739772 | 0,142857143 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,17739772 | 0,19047619 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,135135 | 0 |
| 0,17739772 | 0,238095238 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,108108 | 0 |
| 0,17739772 | 0,285714286 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,108108 | 0,891615 |
| 0,17739772 | 0,333333333 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,081081 | 0 |
| 0,17739772 | 0,380952381 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |
| 0,17739772 | 0,428571429 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,135135 | 0 |
| 0,17739772 | 0,476190476 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,17739772 | 0,523809524 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,162162 | 0 |
| 0,17739772 | 0,571428571 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,054054 | 0 |
| 0,17739772 | 0,619047619 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |
| 0,17739772 | 0,666666667 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |
| 0,17739772 | 0,714285714 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,081081 | 0 |
| 0,17739772 | 0,761904762 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |
| 0,17739772 | 0,80952381 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,17739772 | 0,857142857 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,17739772 | 0,904761905 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |
| 0,17739772 | 0,952380952 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,054054 | 0 |
| 0,17739772 | 1 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,027027 | 0 |
| 0,19047619 | 0,047619048 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,095238095 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,142857143 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,19047619 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,238095238 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,285714286 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,333333333 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |

Appendix 12

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,19047619 | 0,380952381 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,428571429 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,476190476 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,523809524 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,571428571 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,619047619 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,666666667 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,714285714 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,761904762 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,80952381 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,857142857 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,904761905 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 0,952380952 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,19047619 | 1 | 0 | 0,5 | 0,007404 | 1 | 0,059691 | 0,027027 | 0 |
| 0,19047619 | 0,047619048 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0,640498 |
| 0,19047619 | 0,095238095 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,432432 | 0 |
| 0,19047619 | 0,142857143 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,378378 | 0,655144 |
| 0,19047619 | 0,19047619 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,459459 | 0 |
| 0,19047619 | 0,238095238 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,567568 | 0 |
| 0,19047619 | 0,285714286 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,351351 | 0 |
| 0,19047619 | 0,333333333 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 1 |
| 0,19047619 | 0,380952381 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0,19047619 | 0,428571429 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,567568 | 0 |
| 0,19047619 | 0,476190476 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,621622 | 0 |
| 0,19047619 | 0,523809524 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,675676 | 0 |
| 0,19047619 | 0,571428571 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,648649 | 0 |
| 0,19047619 | 0,619047619 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,756757 | 0 |
| 0,19047619 | 0,666666667 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 1 | 0 |
| 0,19047619 | 0,714285714 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |

Appendix 12

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,19047619 | 0,761904762 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,351351 | 0 |
| 0,19047619 | 0,80952381 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,378378 | 0 |
| 0,19047619 | 0,857142857 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,432432 | 0 |
| 0,19047619 | 0,904761905 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,486486 | 0,792689 |
| 0,19047619 | 0,952380952 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,432432 | 0,738697 |
| 0,19047619 | 1 | 0 | 0,5 | 1 | 0,034835 | 0,117541 | 0,378378 | 0 |
| 0,200536553 | 0,047619048 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,095238095 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,142857143 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,19047619 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,238095238 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,027027 | 0 |
| 0,200536553 | 0,285714286 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,027027 | 0 |
| 0,200536553 | 0,333333333 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,027027 | 0 |
| 0,200536553 | 0,380952381 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,428571429 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,027027 | 0 |
| 0,200536553 | 0,476190476 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,523809524 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,027027 | 0 |
| 0,200536553 | 0,571428571 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,619047619 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,666666667 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,714285714 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,761904762 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,80952381 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,857142857 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,904761905 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,952380952 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 1 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,200536553 | 0,047619048 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,200536553 | 0,095238095 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |

Appendix 12

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,200536553 | 0,142857143 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,200536553 | 0,19047619 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,200536553 | 0,238095238 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,027027 | 0 |
| 0,200536553 | 0,285714286 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,054054 | 0 |
| 0,200536553 | 0,333333333 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,027027 | 0 |
| 0,200536553 | 0,380952381 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,027027 | 0 |
| 0,200536553 | 0,428571429 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,200536553 | 0,476190476 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,027027 | 0 |
| 0,200536553 | 0,523809524 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,200536553 | 0,571428571 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,027027 | 0 |
| 0,200536553 | 0,619047619 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,200536553 | 0,666666667 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,200536553 | 0,714285714 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,200536553 | 0,761904762 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,200536553 | 0,80952381 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,200536553 | 0,857142857 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,200536553 | 0,904761905 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,054054 | 0 |
| 0,200536553 | 0,952380952 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,081081 | 0 |
| 0,200536553 | 1 | 0 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,054054 | 0 |
| 0,200536553 | 0,047619048 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,200536553 | 0,095238095 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,200536553 | 0,142857143 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,27027 | 0 |
| 0,200536553 | 0,19047619 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,216216 | 0 |
| 0,200536553 | 0,238095238 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,162162 | 0 |
| 0,200536553 | 0,285714286 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,054054 | 0 |
| 0,200536553 | 0,333333333 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,081081 | 0 |
| 0,200536553 | 0,380952381 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,108108 | 0 |
| 0,200536553 | 0,428571429 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,200536553 | 0,476190476 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,054054 | 0 |

Appendix 12

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,200536553 | 0,523809524 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,054054 | 0 |
| 0,200536553 | 0,571428571 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,081081 | 0 |
| 0,200536553 | 0,619047619 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,027027 | 0 |
| 0,200536553 | 0,666666667 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,108108 | 0 |
| 0,200536553 | 0,714285714 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,216216 | 0 |
| 0,200536553 | 0,761904762 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,200536553 | 0,80952381 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,108108 | 0 |
| 0,200536553 | 0,857142857 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,027027 | 0 |
| 0,200536553 | 0,904761905 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,243243 | 0 |
| 0,200536553 | 0,952380952 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,162162 | 0 |
| 0,200536553 | 1 | 0 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,108108 | 0 |
| 0,211602951 | 0,047619048 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,211602951 | 0,095238095 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,211602951 | 0,142857143 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,108108 | 0 |
| 0,211602951 | 0,19047619 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,108108 | 0 |
| 0,211602951 | 0,238095238 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,054054 | 0 |
| 0,211602951 | 0,285714286 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,027027 | 0 |
| 0,211602951 | 0,333333333 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,081081 | 0 |
| 0,211602951 | 0,380952381 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,216216 | 0 |
| 0,211602951 | 0,428571429 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,211602951 | 0,476190476 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,211602951 | 0,523809524 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,211602951 | 0,571428571 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,027027 | 0 |
| 0,211602951 | 0,619047619 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,027027 | 0 |
| 0,211602951 | 0,666666667 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,211602951 | 0,714285714 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,211602951 | 0,761904762 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,211602951 | 0,80952381 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,211602951 | 0,857142857 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |

Appendix 12

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,211602951 | 0,904761905 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,211602951 | 0,952380952 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,211602951 | 1 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,224010731 | 0,047619048 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,095238095 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,142857143 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,108108 | 0 |
| 0,224010731 | 0,19047619 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,238095238 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,054054 | 0 |
| 0,224010731 | 0,285714286 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,027027 | 0 |
| 0,224010731 | 0,333333333 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,380952381 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,054054 | 0 |
| 0,224010731 | 0,428571429 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,027027 | 0 |
| 0,224010731 | 0,476190476 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,523809524 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,571428571 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,619047619 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,666666667 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,714285714 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,761904762 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,80952381 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,857142857 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,904761905 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,224010731 | 0,952380952 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,027027 | 0 |
| 0,224010731 | 1 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,232729712 | 0,047619048 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,232729712 | 0,095238095 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,232729712 | 0,142857143 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,232729712 | 0,19047619 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,081081 | 0 |
| 0,232729712 | 0,238095238 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,135135 | 0 |

Appendix 12

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,232729712 | 0,285714286 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,189189 | 0 |
| 0,232729712 | 0,333333333 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,135135 | 0 |
| 0,232729712 | 0,380952381 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,135135 | 0 |
| 0,232729712 | 0,428571429 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,081081 | 0 |
| 0,232729712 | 0,476190476 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,232729712 | 0,523809524 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,232729712 | 0,571428571 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,081081 | 0 |
| 0,232729712 | 0,619047619 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,243243 | 0 |
| 0,232729712 | 0,666666667 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,135135 | 0 |
| 0,232729712 | 0,714285714 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,108108 | 0 |
| 0,232729712 | 0,761904762 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,135135 | 0 |
| 0,232729712 | 0,80952381 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,232729712 | 0,857142857 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,135135 | 0 |
| 0,232729712 | 0,904761905 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,108108 | 0 |
| 0,232729712 | 0,952380952 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,054054 | 0 |
| 0,232729712 | 1 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,027027 | 0 |
| 0,232729712 | 0,047619048 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,232729712 | 0,095238095 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,081081 | 0 |
| 0,232729712 | 0,142857143 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,162162 | 0 |
| 0,232729712 | 0,19047619 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,135135 | 0 |
| 0,232729712 | 0,238095238 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,189189 | 0 |
| 0,232729712 | 0,285714286 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,054054 | 0 |
| 0,232729712 | 0,333333333 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,232729712 | 0,380952381 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,108108 | 0 |
| 0,232729712 | 0,428571429 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,162162 | 0 |
| 0,232729712 | 0,476190476 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,054054 | 0 |
| 0,232729712 | 0,523809524 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,027027 | 0 |
| 0,232729712 | 0,571428571 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,081081 | 0 |
| 0,232729712 | 0,619047619 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,135135 | 0 |

Appendix 12

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,232729712 | 0,666666667 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,232729712 | 0,714285714 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,081081 | 0 |
| 0,232729712 | 0,761904762 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,054054 | 0 |
| 0,232729712 | 0,80952381 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,054054 | 0 |
| 0,232729712 | 0,857142857 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,054054 | 0 |
| 0,232729712 | 0,904761905 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,135135 | 0 |
| 0,232729712 | 0,952380952 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,232729712 | 1 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |

Appendix 13

Appendix 13 presents the data set used to investigate Spain.

The unit of analysis employed throughout the data set is the day.

List of acronyms and abbreviations:

gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation
catastropheday: Day of the catastrophe (number of days elapsed since the onset of a selected natural disaster)
clgovernment: Centre-left government (presence or not of centre-left parties in government of donor country under investigation)
election: Election (presence or not of an electoral period in the donor country under investigation)
fatalities: Fatalities (number of fatalities recorded for the natural disaster under investigation)
affected: Affected (number of affected people recorded for the natural disaster under investigation)
damage: Damage (estimated damages recorded for the natural disaster under investigation)
totarticles: Total number of articles (total number of articles recorded on the natural disaster under investigation)
log_disburse: Logarithmic disbursement (logarithmic disbursement of emergency humanitarian assistance recorded)

Appendix 13

| gdpus | catastropheday | clgovernment | election | fatalities | affected | damage | totarticles | log_disburse |
|---|---|---|---|---|---|---|---|---|
| 0,330315225 | 0,047619048 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,330315225 | 0,095238095 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,210526 | 0 |
| 0,330315225 | 0,142857143 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,157895 | 0 |
| 0,330315225 | 0,19047619 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,105263 | 0 |
| 0,330315225 | 0,238095238 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,157895 | 0 |
| 0,330315225 | 0,285714286 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,210526 | 0,924306 |
| 0,330315225 | 0,333333333 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,105263 | 0 |
| 0,330315225 | 0,380952381 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,105263 | 0 |
| 0,330315225 | 0,428571429 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,330315225 | 0,476190476 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,210526 | 0 |
| 0,330315225 | 0,523809524 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,263158 | 0 |
| 0,330315225 | 0,571428571 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,052632 | 0 |
| 0,330315225 | 0,619047619 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,330315225 | 0,666666667 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,330315225 | 0,714285714 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,330315225 | 0,761904762 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,330315225 | 0,80952381 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,052632 | 0 |
| 0,330315225 | 0,857142857 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,330315225 | 0,904761905 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,330315225 | 0,952380952 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,330315225 | 1 | 0 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,052632 | 0 |
| 0,390342052 | 0,047619048 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,095238095 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,142857143 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,19047619 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,238095238 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,285714286 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,333333333 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |

Appendix 13

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,390342052 | 0,380952381 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,428571429 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,476190476 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,523809524 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,571428571 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,619047619 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,666666667 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,714285714 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,761904762 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,80952381 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,857142857 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,904761905 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,952380952 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 1 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,390342052 | 0,047619048 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0,390342052 | 0,095238095 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,315789 | 0 |
| 0,390342052 | 0,142857143 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,473684 | 0 |
| 0,390342052 | 0,19047619 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,736842 | 0 |
| 0,390342052 | 0,238095238 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,578947 | 0 |
| 0,390342052 | 0,285714286 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,421053 | 0,817235 |
| 0,390342052 | 0,333333333 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0,390342052 | 0,380952381 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,368421 | 0 |
| 0,390342052 | 0,428571429 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,526316 | 0 |
| 0,390342052 | 0,476190476 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 1 | 0 |
| 0,390342052 | 0,523809524 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,947368 | 0 |
| 0,390342052 | 0,571428571 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,631579 | 0 |
| 0,390342052 | 0,619047619 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,684211 | 0 |
| 0,390342052 | 0,666666667 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,421053 | 0 |
| 0,390342052 | 0,714285714 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,473684 | 0 |

Appendix 13

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,390342052 | 0,761904762 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,421053 | 0 |
| 0,390342052 | 0,80952381 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,473684 | 0 |
| 0,390342052 | 0,857142857 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,526316 | 0 |
| 0,390342052 | 0,904761905 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,789474 | 0 |
| 0,390342052 | 0,952380952 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,368421 | 0 |
| 0,390342052 | 1 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,157895 | 0 |
| 0,416163649 | 0,047619048 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,095238095 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,142857143 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,052632 | 0 |
| 0,416163649 | 0,19047619 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,238095238 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,105263 | 0 |
| 0,416163649 | 0,285714286 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,052632 | 0 |
| 0,416163649 | 0,333333333 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,052632 | 0 |
| 0,416163649 | 0,380952381 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,428571429 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,476190476 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,523809524 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,571428571 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,619047619 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,666666667 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,714285714 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,761904762 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,80952381 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,857142857 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,904761905 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,952380952 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 1 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,416163649 | 0,047619048 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,416163649 | 0,095238095 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |

Appendix 13

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,416163649 | 0,142857143 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,052632 | 0 |
| 0,416163649 | 0,19047619 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,416163649 | 0,238095238 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,052632 | 0 |
| 0,416163649 | 0,285714286 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,052632 | 0 |
| 0,416163649 | 0,333333333 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,157895 | 0 |
| 0,416163649 | 0,380952381 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,157895 | 0 |
| 0,416163649 | 0,428571429 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,263158 | 0 |
| 0,416163649 | 0,476190476 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,210526 | 0 |
| 0,416163649 | 0,523809524 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,105263 | 0 |
| 0,416163649 | 0,571428571 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,052632 | 0 |
| 0,416163649 | 0,619047619 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,416163649 | 0,666666667 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,416163649 | 0,714285714 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,416163649 | 0,761904762 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,416163649 | 0,80952381 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,052632 | 0 |
| 0,416163649 | 0,857142857 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,157895 | 0 |
| 0,416163649 | 0,904761905 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,263158 | 0 |
| 0,416163649 | 0,952380952 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,263158 | 0 |
| 0,416163649 | 1 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,263158 | 0 |
| 0,416163649 | 0,047619048 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,416163649 | 0,095238095 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,368421 | 0,974429 |
| 0,416163649 | 0,142857143 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,526316 | 0 |
| 0,416163649 | 0,19047619 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,368421 | 0 |
| 0,416163649 | 0,238095238 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,157895 | 0 |
| 0,416163649 | 0,285714286 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,157895 | 0 |
| 0,416163649 | 0,333333333 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,210526 | 0 |
| 0,416163649 | 0,380952381 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |
| 0,416163649 | 0,428571429 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,263158 | 0 |
| 0,416163649 | 0,476190476 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,105263 | 0 |

Appendix 13

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,416163649 | 0,523809524 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,315789 | 0 |
| 0,416163649 | 0,571428571 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,368421 | 0 |
| 0,416163649 | 0,619047619 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,210526 | 0 |
| 0,416163649 | 0,666666667 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,263158 | 0 |
| 0,416163649 | 0,714285714 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |
| 0,416163649 | 0,761904762 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |
| 0,416163649 | 0,80952381 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,105263 | 0 |
| 0,416163649 | 0,857142857 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,052632 | 0 |
| 0,416163649 | 0,904761905 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,315789 | 0 |
| 0,416163649 | 0,952380952 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,210526 | 0 |
| 0,416163649 | 1 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,105263 | 0 |
| 0,453051643 | 0,047619048 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,453051643 | 0,095238095 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,526316 | 0 |
| 0,453051643 | 0,142857143 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,421053 | 0 |
| 0,453051643 | 0,19047619 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,263158 | 0 |
| 0,453051643 | 0,238095238 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,105263 | 0 |
| 0,453051643 | 0,285714286 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 0,453051643 | 0,333333333 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 0,453051643 | 0,380952381 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,453051643 | 0,428571429 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,453051643 | 0,476190476 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,105263 | 0 |
| 0,453051643 | 0,523809524 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 0,453051643 | 0,571428571 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,105263 | 0 |
| 0,453051643 | 0,619047619 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 0,453051643 | 0,666666667 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,453051643 | 0,714285714 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,453051643 | 0,761904762 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,453051643 | 0,80952381 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,453051643 | 0,857142857 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |

Appendix 13

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,453051643 | 0,904761905 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 0,453051643 | 0,952380952 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,453051643 | 1 | 1 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,052632 | 0 |
| 0,492622401 | 0,047619048 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,052632 | 0 |
| 0,492622401 | 0,095238095 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,105263 | 0 |
| 0,492622401 | 0,142857143 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,157895 | 0 |
| 0,492622401 | 0,19047619 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,105263 | 0 |
| 0,492622401 | 0,238095238 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,157895 | 0 |
| 0,492622401 | 0,285714286 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,105263 | 0 |
| 0,492622401 | 0,333333333 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,492622401 | 0,380952381 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,492622401 | 0,428571429 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,492622401 | 0,476190476 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,492622401 | 0,523809524 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,492622401 | 0,571428571 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,492622401 | 0,619047619 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,492622401 | 0,666666667 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,492622401 | 0,714285714 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,052632 | 0 |
| 0,492622401 | 0,761904762 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,492622401 | 0,80952381 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,492622401 | 0,857142857 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,492622401 | 0,904761905 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,492622401 | 0,952380952 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,492622401 | 1 | 1 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,497317237 | 0,047619048 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,497317237 | 0,095238095 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,497317237 | 0,142857143 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0,497317237 | 0,19047619 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0,497317237 | 0,238095238 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,315789 | 0,951388 |

Appendix 13

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,497317237 | 0,285714286 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,578947 | 0 |
| 0,497317237 | 0,333333333 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,210526 | 0,910389 |
| 0,497317237 | 0,380952381 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0,497317237 | 0,428571429 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,421053 | 0 |
| 0,497317237 | 0,476190476 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0,497317237 | 0,523809524 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,315789 | 0 |
| 0,497317237 | 0,571428571 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,263158 | 0 |
| 0,497317237 | 0,619047619 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,210526 | 0 |
| 0,497317237 | 0,666666667 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0,497317237 | 0,714285714 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0,497317237 | 0,761904762 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,105263 | 0 |
| 0,497317237 | 0,80952381 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,105263 | 0 |
| 0,497317237 | 0,857142857 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0,497317237 | 0,904761905 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,052632 | 0 |
| 0,497317237 | 0,952380952 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,105263 | 0 |
| 0,497317237 | 1 | 1 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,157895 | 0 |
| 0,497317237 | 0,047619048 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,497317237 | 0,095238095 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,631579 | 0 |
| 0,497317237 | 0,142857143 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,263158 | 1 |
| 0,497317237 | 0,19047619 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,210526 | 0 |
| 0,497317237 | 0,238095238 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,210526 | 0 |
| 0,497317237 | 0,285714286 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,210526 | 0 |
| 0,497317237 | 0,333333333 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,157895 | 0 |
| 0,497317237 | 0,380952381 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,157895 | 0 |
| 0,497317237 | 0,428571429 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,157895 | 0 |
| 0,497317237 | 0,476190476 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,105263 | 0 |
| 0,497317237 | 0,523809524 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,210526 | 0 |
| 0,497317237 | 0,571428571 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,105263 | 0 |
| 0,497317237 | 0,619047619 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,210526 | 0 |

Appendix 13

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,497317237 | 0,666666667 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,052632 | 0 |
| 0,497317237 | 0,714285714 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,105263 | 0 |
| 0,497317237 | 0,761904762 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,157895 | 0 |
| 0,497317237 | 0,80952381 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,052632 | 0 |
| 0,497317237 | 0,857142857 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,497317237 | 0,904761905 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,105263 | 0 |
| 0,497317237 | 0,952380952 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,497317237 | 1 | 1 | 0,5 | 0,386194 | 0,65861 | 1 | 0,052632 | 0 |

## Appendix 14

Appendix 14 presents the data set used to investigate Germany.

The unit of analysis employed throughout the data set is the day.

List of acronyms and abbreviations:

gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation
catastropheday: Day of the catastrophe (number of days elapsed since the onset of a selected natural disaster)
clgovernment: Centre-left government (presence or not of centre-left parties in government of donor country under investigation)
election: Election (presence or not of an electoral period in the donor country under investigation)
fatalities: Fatalities (number of fatalities recorded for the natural disaster under investigation)
affected: Affected (number of affected people recorded for the natural disaster under investigation)
damage: Damage (estimated damages recorded for the natural disaster under investigation)
totarticles: Total number of articles (total number of articles recorded on the natural disaster under investigation)
log_disburse: Logarithmic disbursement (logarithmic disbursement of emergency humanitarian assistance recorded)

Appendix 14

| gdpus | catastropheday | clgovernment | election | fatalities | affected | damage | totarticles | log_disburse |
|---|---|---|---|---|---|---|---|---|
| 0,794433266 | 0,047619048 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,794433266 | 0,095238095 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,142857 | 0 |
| 0,794433266 | 0,142857143 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,794433266 | 0,19047619 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,285714 | 0 |
| 0,794433266 | 0,238095238 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,285714 | 0 |
| 0,794433266 | 0,285714286 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,380952 | 0,91809 |
| 0,794433266 | 0,333333333 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,238095 | 0 |
| 0,794433266 | 0,380952381 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,142857 | 0 |
| 0,794433266 | 0,428571429 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,190476 | 0 |
| 0,794433266 | 0,476190476 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,794433266 | 0,523809524 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,142857 | 0 |
| 0,794433266 | 0,571428571 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,047619 | 0 |
| 0,794433266 | 0,619047619 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,794433266 | 0,666666667 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,047619 | 0 |
| 0,794433266 | 0,714285714 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,095238 | 0 |
| 0,794433266 | 0,761904762 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,095238 | 0 |
| 0,794433266 | 0,80952381 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,794433266 | 0,857142857 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,047619 | 0 |
| 0,794433266 | 0,904761905 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0,047619 | 0 |
| 0,794433266 | 0,952380952 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,794433266 | 1 | 1 | 0,5 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,868879946 | 0,047619048 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,095238095 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,142857143 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,19047619 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,238095238 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,285714286 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,333333333 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |

Appendix 14

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,868879946 | 0,380952381 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,428571429 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,476190476 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,523809524 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,571428571 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,619047619 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,666666667 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,714285714 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,761904762 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,80952381 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,857142857 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0,047619 | 0 |
| 0,868879946 | 0,904761905 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,952380952 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 1 | 1 | 0,5 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,868879946 | 0,047619048 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0,868879946 | 0,095238095 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,190476 | 0,817278 |
| 0,868879946 | 0,142857143 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,047619 | 0 |
| 0,868879946 | 0,19047619 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,380952 | 0 |
| 0,868879946 | 0,238095238 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,238095 | 0,842069 |
| 0,868879946 | 0,285714286 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,571429 | 0 |
| 0,868879946 | 0,333333333 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |
| 0,868879946 | 0,380952381 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0,982683 |
| 0,868879946 | 0,428571429 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,285714 | 0 |
| 0,868879946 | 0,476190476 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 1 | 0 |
| 0,868879946 | 0,523809524 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,761905 | 1 |
| 0,868879946 | 0,571428571 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,428571 | 0,826023 |
| 0,868879946 | 0,619047619 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,714286 | 0 |
| 0,868879946 | 0,666666667 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,619048 | 0 |
| 0,868879946 | 0,714285714 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0 | 0 |

Appendix 14

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,868879946 | 0,761904762 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,52381 | 0 |
| 0,868879946 | 0,80952381 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,190476 | 0,815523 |
| 0,868879946 | 0,857142857 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,428571 | 0 |
| 0,868879946 | 0,904761905 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,238095 | 0 |
| 0,868879946 | 0,952380952 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,285714 | 0 |
| 0,868879946 | 1 | 1 | 0,5 | 1 | 0,034835 | 0,117541 | 0,333333 | 0 |
| 0,905767941 | 0,047619048 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,095238095 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,142857143 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,19047619 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,238095238 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,047619 | 0 |
| 0,905767941 | 0,285714286 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,047619 | 0 |
| 0,905767941 | 0,333333333 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,047619 | 0 |
| 0,905767941 | 0,380952381 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,428571429 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,476190476 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,047619 | 0 |
| 0,905767941 | 0,523809524 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,571428571 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,619047619 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,666666667 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,714285714 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,761904762 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,80952381 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,857142857 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,904761905 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,952380952 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,095238 | 0 |
| 0,905767941 | 1 | 1 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,905767941 | 0,047619048 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,905767941 | 0,095238095 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |

Appendix 14

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,905767941 | 0,142857143 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,905767941 | 0,19047619 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0,905767941 | 0,238095238 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,905767941 | 0,285714286 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,095238 | 0 |
| 0,905767941 | 0,333333333 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,905767941 | 0,380952381 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0,905767941 | 0,428571429 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,905767941 | 0,476190476 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0,905767941 | 0,523809524 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,142857 | 0 |
| 0,905767941 | 0,571428571 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0,905767941 | 0,619047619 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,095238 | 0 |
| 0,905767941 | 0,666666667 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,905767941 | 0,714285714 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0,905767941 | 0,761904762 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,905767941 | 0,80952381 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0,905767941 | 0,857142857 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,905767941 | 0,904761905 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0,905767941 | 0,952380952 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0,905767941 | 1 | 1 | 0,5 | 0,007245 | 0,035998 | 0,045459 | 0,047619 | 0 |
| 0,905767941 | 0,047619048 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0,893526 |
| 0,905767941 | 0,095238095 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,905767941 | 0,142857143 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,333333 | 0,891938 |
| 0,905767941 | 0,19047619 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,238095 | 0 |
| 0,905767941 | 0,238095238 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,095238 | 0,512672 |
| 0,905767941 | 0,285714286 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,238095 | 0 |
| 0,905767941 | 0,333333333 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,095238 | 0 |
| 0,905767941 | 0,380952381 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,047619 | 0 |
| 0,905767941 | 0,428571429 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,905767941 | 0,476190476 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,095238 | 0 |

Appendix 14

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,905767941 | 0,523809524 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,142857 | 0 |
| 0,905767941 | 0,571428571 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,095238 | 0,731573 |
| 0,905767941 | 0,619047619 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,238095 | 0 |
| 0,905767941 | 0,666666667 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,380952 | 0 |
| 0,905767941 | 0,714285714 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,047619 | 0 |
| 0,905767941 | 0,761904762 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,905767941 | 0,80952381 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,095238 | 0 |
| 0,905767941 | 0,857142857 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,095238 | 0 |
| 0,905767941 | 0,904761905 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,047619 | 0 |
| 0,905767941 | 0,952380952 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,333333 | 0 |
| 0,905767941 | 1 | 1 | 0,5 | 0,329609 | 0,075745 | 0,072942 | 0,142857 | 0 |
| 0,943661972 | 0,047619048 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,943661972 | 0,095238095 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,943661972 | 0,142857143 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,380952 | 0 |
| 0,943661972 | 0,19047619 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,238095 | 0 |
| 0,943661972 | 0,238095238 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,047619 | 0 |
| 0,943661972 | 0,285714286 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,238095 | 0 |
| 0,943661972 | 0,333333333 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,047619 | 0 |
| 0,943661972 | 0,380952381 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,943661972 | 0,428571429 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,943661972 | 0,476190476 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,943661972 | 0,523809524 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,943661972 | 0,571428571 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,142857 | 0 |
| 0,943661972 | 0,619047619 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,047619 | 0 |
| 0,943661972 | 0,666666667 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0,095238 | 0 |
| 0,943661972 | 0,714285714 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,943661972 | 0,761904762 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,943661972 | 0,80952381 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,943661972 | 0,857142857 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |

Appendix 14

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,943661972 | 0,904761905 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,943661972 | 0,952380952 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,943661972 | 1 | 0 | 0,5 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,985244802 | 0,047619048 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,985244802 | 0,095238095 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,985244802 | 0,142857143 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,095238 | 0 |
| 0,985244802 | 0,19047619 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,985244802 | 0,238095238 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,095238 | 0 |
| 0,985244802 | 0,285714286 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,095238 | 0 |
| 0,985244802 | 0,333333333 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,047619 | 0 |
| 0,985244802 | 0,380952381 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,047619 | 0 |
| 0,985244802 | 0,428571429 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,047619 | 0 |
| 0,985244802 | 0,476190476 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,985244802 | 0,523809524 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,985244802 | 0,571428571 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,047619 | 0 |
| 0,985244802 | 0,619047619 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,985244802 | 0,666666667 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,985244802 | 0,714285714 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,985244802 | 0,761904762 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,985244802 | 0,80952381 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,985244802 | 0,857142857 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,985244802 | 0,904761905 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0,047619 | 0 |
| 0,985244802 | 0,952380952 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,985244802 | 1 | 0 | 0,5 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 1 | 0,047619048 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 1 | 0,095238095 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 1 | 0,142857143 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 1 | 0,19047619 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,095238 | 0 |
| 1 | 0,238095238 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,190476 | 0 |

Appendix 14

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 0,285714286 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,238095 | 0 |
| 1 | 0,333333333 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,095238 | 0 |
| 1 | 0,380952381 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,333333 | 0 |
| 1 | 0,428571429 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,190476 | 0 |
| 1 | 0,476190476 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 1 | 0,523809524 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 1 | 0,571428571 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,142857 | 0 |
| 1 | 0,619047619 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,238095 | 0 |
| 1 | 0,666666667 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,285714 | 0 |
| 1 | 0,714285714 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,190476 | 0 |
| 1 | 0,761904762 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,142857 | 0 |
| 1 | 0,80952381 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,047619 | 0 |
| 1 | 0,857142857 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,095238 | 0 |
| 1 | 0,904761905 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,190476 | 0 |
| 1 | 0,952380952 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 1 | 1 | 0 | 0,5 | 0,611166 | 0,045974 | 0,047282 | 0,047619 | 0 |
| 1 | 0,047619048 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 1 | 0,095238095 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,238095 | 0 |
| 1 | 0,142857143 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,238095 | 0 |
| 1 | 0,19047619 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,190476 | 0 |
| 1 | 0,238095238 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,142857 | 0 |
| 1 | 0,285714286 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,095238 | 0 |
| 1 | 0,333333333 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,142857 | 0 |
| 1 | 0,380952381 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,095238 | 0 |
| 1 | 0,428571429 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,190476 | 0 |
| 1 | 0,476190476 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,095238 | 0 |
| 1 | 0,523809524 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0,838553 |
| 1 | 0,571428571 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,047619 | 0,844894 |
| 1 | 0,619047619 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,142857 | 0 |

Appendix 15

Appendix 15 presents the data set used to investigate France.

The unit of analysis employed throughout the data set is the day.

List of acronyms and abbreviations:

gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation
catastropheday: Day of the catastrophe (number of days elapsed since the onset of a selected natural disaster)
clgovernment: Centre-left government (presence or not of centre-left parties in government of donor country under investigation)
election: Election (presence or not of an electoral period in the donor country under investigation)
fatalities: Fatalities (number of fatalities recorded for the natural disaster under investigation)
affected: Affected (number of affected people recorded for the natural disaster under investigation)
damage: Damage (estimated damages recorded for the natural disaster under investigation)
totarticles: Total number of articles (total number of articles recorded on the natural disaster under investigation)
log_disburse: Logarithmic disbursement (logarithmic disbursement of emergency humanitarian assistance recorded)

Appendix 15

| gdpus | catastropheday | clgovernment | election | fatalities | affected | damage | totarticles | log_disburse |
|---|---|---|---|---|---|---|---|---|
| 0,585513078 | 0,047619048 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 0,095238095 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0,585513078 | 0,142857143 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0,585513078 | 0,19047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0,585513078 | 0,238095238 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,241379 | 0 |
| 0,585513078 | 0,285714286 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,103448 | 0,827749 |
| 0,585513078 | 0,333333333 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,172414 | 0 |
| 0,585513078 | 0,380952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 0,428571429 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,034483 | 0 |
| 0,585513078 | 0,476190476 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0,585513078 | 0,523809524 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0,585513078 | 0,571428571 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0,585513078 | 0,619047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 0,666666667 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0,585513078 | 0,714285714 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,068966 | 0 |
| 0,585513078 | 0,761904762 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,034483 | 0 |
| 0,585513078 | 0,80952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 0,857142857 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,034483 | 0 |
| 0,585513078 | 0,904761905 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 0,952380952 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,585513078 | 1 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,622401073 | 0,047619048 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,095238095 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,142857143 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,19047619 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,238095238 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,285714286 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,333333333 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |

Appendix 15

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,622401073 | 0,380952381 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,428571429 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,476190476 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,523809524 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,571428571 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,619047619 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,666666667 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,714285714 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,761904762 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,80952381 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,857142857 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,904761905 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 0,952380952 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,622401073 | 1 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0,034483 | 0 |
| 0,622401073 | 0,047619048 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0 | 0,918425 |
| 0,622401073 | 0,095238095 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,137931 | 0 |
| 0,622401073 | 0,142857143 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,275862 | 0 |
| 0,622401073 | 0,19047619 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,310345 | 0,902171 |
| 0,622401073 | 0,238095238 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,517241 | 0,844228 |
| 0,622401073 | 0,285714286 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,586207 | 0,844817 |
| 0,622401073 | 0,333333333 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,551724 | 1 |
| 0,622401073 | 0,380952381 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,275862 | 0 |
| 0,622401073 | 0,428571429 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,37931 | 0 |
| 0,622401073 | 0,476190476 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,62069 | 0 |
| 0,622401073 | 0,523809524 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,655172 | 0 |
| 0,622401073 | 0,571428571 | 0 | 1 | 1 | 0,034835 | 0,117541 | 1 | 0 |
| 0,622401073 | 0,619047619 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,758621 | 0 |
| 0,622401073 | 0,666666667 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,517241 | 0 |
| 0,622401073 | 0,714285714 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,517241 | 0 |

Appendix 15

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,622401073 | 0,761904762 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,137931 | 0 |
| 0,622401073 | 0,80952381 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,448276 | 0,686471 |
| 0,622401073 | 0,857142857 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,517241 | 0 |
| 0,622401073 | 0,904761905 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,241379 | 0,91054 |
| 0,622401073 | 0,952380952 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,172414 | 0 |
| 0,622401073 | 1 | 0 | 1 | 1 | 0,034835 | 0,117541 | 0,344828 | 0,58782 |
| 0,654594232 | 0,047619048 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,095238095 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,142857143 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,19047619 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,238095238 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,285714286 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,034483 | 0 |
| 0,654594232 | 0,333333333 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,380952381 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,428571429 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,034483 | 0 |
| 0,654594232 | 0,476190476 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,523809524 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,571428571 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,619047619 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,666666667 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,714285714 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,761904762 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,80952381 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,857142857 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,904761905 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,952380952 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 1 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,654594232 | 0,047619048 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0,652673 |
| 0,654594232 | 0,095238095 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |

Appendix 15

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,654594232 | 0,142857143 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,654594232 | 0,19047619 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,654594232 | 0,238095238 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,654594232 | 0,285714286 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,654594232 | 0,333333333 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,034483 | 0 |
| 0,654594232 | 0,380952381 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,654594232 | 0,428571429 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,654594232 | 0,476190476 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,034483 | 0 |
| 0,654594232 | 0,523809524 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,654594232 | 0,571428571 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,654594232 | 0,619047619 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,654594232 | 0,666666667 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,034483 | 0 |
| 0,654594232 | 0,714285714 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,654594232 | 0,761904762 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,654594232 | 0,80952381 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,654594232 | 0,857142857 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,654594232 | 0,904761905 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,034483 | 0 |
| 0,654594232 | 0,952380952 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,068966 | 0 |
| 0,654594232 | 1 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,034483 | 0 |
| 0,654594232 | 0,047619048 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,654594232 | 0,095238095 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,654594232 | 0,142857143 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,172414 | 0 |
| 0,654594232 | 0,19047619 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,241379 | 0 |
| 0,654594232 | 0,238095238 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,172414 | 0 |
| 0,654594232 | 0,285714286 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,103448 | 0 |
| 0,654594232 | 0,333333333 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,103448 | 0 |
| 0,654594232 | 0,380952381 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,137931 | 0 |
| 0,654594232 | 0,428571429 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0 |
| 0,654594232 | 0,476190476 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,103448 | 0 |

Appendix 15

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,654594232 | 0,523809524 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,068966 | 0 |
| 0,654594232 | 0,571428571 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0,864417 |
| 0,654594232 | 0,619047619 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,068966 | 0 |
| 0,654594232 | 0,666666667 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0 |
| 0,654594232 | 0,714285714 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,103448 | 0 |
| 0,654594232 | 0,761904762 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0 |
| 0,654594232 | 0,80952381 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0 |
| 0,654594232 | 0,857142857 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0 |
| 0,654594232 | 0,904761905 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,654594232 | 0,952380952 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,034483 | 0,749415 |
| 0,654594232 | 1 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,103448 | 0 |
| 0,683433937 | 0,047619048 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,683433937 | 0,095238095 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,068966 | 0 |
| 0,683433937 | 0,142857143 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,103448 | 0 |
| 0,683433937 | 0,19047619 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,206897 | 0 |
| 0,683433937 | 0,238095238 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,103448 | 0 |
| 0,683433937 | 0,285714286 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,034483 | 0 |
| 0,683433937 | 0,333333333 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,034483 | 0 |
| 0,683433937 | 0,380952381 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,034483 | 0 |
| 0,683433937 | 0,428571429 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,683433937 | 0,476190476 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,683433937 | 0,523809524 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,683433937 | 0,571428571 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,683433937 | 0,619047619 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,683433937 | 0,666666667 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,034483 | 0 |
| 0,683433937 | 0,714285714 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,683433937 | 0,761904762 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,683433937 | 0,80952381 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,683433937 | 0,857142857 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |

Appendix 15

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,683433937 | 0,904761905 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,034483 | 0 |
| 0,683433937 | 0,952380952 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,683433937 | 1 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,723004695 | 0,047619048 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,723004695 | 0,095238095 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,034483 | 0 |
| 0,723004695 | 0,142857143 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,068966 | 0 |
| 0,723004695 | 0,19047619 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,034483 | 0 |
| 0,723004695 | 0,238095238 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,103448 | 0 |
| 0,723004695 | 0,285714286 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,034483 | 0 |
| 0,723004695 | 0,333333333 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,034483 | 0 |
| 0,723004695 | 0,380952381 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,723004695 | 0,428571429 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,723004695 | 0,476190476 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,723004695 | 0,523809524 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,723004695 | 0,571428571 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,723004695 | 0,619047619 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,723004695 | 0,666666667 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,723004695 | 0,714285714 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,723004695 | 0,761904762 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,723004695 | 0,80952381 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,723004695 | 0,857142857 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,723004695 | 0,904761905 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,034483 | 0 |
| 0,723004695 | 0,952380952 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,723004695 | 1 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,722334004 | 0,047619048 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,722334004 | 0,095238095 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,722334004 | 0,142857143 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,722334004 | 0,19047619 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,103448 | 0 |
| 0,722334004 | 0,238095238 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,068966 | 0 |

Appendix 15

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,722334004 | 0,285714286 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,068966 | 0 |
| 0,722334004 | 0,333333333 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,137931 | 0 |
| 0,722334004 | 0,380952381 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,241379 | 0 |
| 0,722334004 | 0,428571429 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,103448 | 0 |
| 0,722334004 | 0,476190476 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,034483 | 0 |
| 0,722334004 | 0,523809524 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,137931 | 0 |
| 0,722334004 | 0,571428571 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,137931 | 0 |
| 0,722334004 | 0,619047619 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,068966 | 0 |
| 0,722334004 | 0,666666667 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,103448 | 0 |
| 0,722334004 | 0,714285714 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,103448 | 0 |
| 0,722334004 | 0,761904762 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,137931 | 0 |
| 0,722334004 | 0,80952381 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,034483 | 0 |
| 0,722334004 | 0,857142857 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,103448 | 0 |
| 0,722334004 | 0,904761905 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,068966 | 0 |
| 0,722334004 | 0,952380952 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,722334004 | 1 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,068966 | 0 |
| 0,722334004 | 0,047619048 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,722334004 | 0,095238095 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,034483 | 0 |
| 0,722334004 | 0,142857143 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,310345 | 0,810865 |
| 0,722334004 | 0,19047619 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,206897 | 0 |
| 0,722334004 | 0,238095238 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,172414 | 0 |
| 0,722334004 | 0,285714286 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,275862 | 0 |
| 0,722334004 | 0,333333333 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,068966 | 0 |
| 0,722334004 | 0,380952381 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,103448 | 0 |
| 0,722334004 | 0,428571429 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,206897 | 0 |
| 0,722334004 | 0,476190476 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,137931 | 0 |
| 0,722334004 | 0,523809524 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,172414 | 0,770735 |
| 0,722334004 | 0,571428571 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,068966 | 0,608431 |
| 0,722334004 | 0,619047619 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,034483 | 0 |

Appendix 15

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,722334004 | 0,666666667 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,722334004 | 0,714285714 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,034483 | 0 |
| 0,722334004 | 0,761904762 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,068966 | 0 |
| 0,722334004 | 0,80952381 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,068966 | 0 |
| 0,722334004 | 0,857142857 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,068966 | 0 |
| 0,722334004 | 0,904761905 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,034483 | 0 |
| 0,739719813 | 0,557314063 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,034483 | 0 |
| 0,740444743 | 0,557676305 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |

Appendix 14

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 0,666666667 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 1 | 0,714285714 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,095238 | 0 |
| 1 | 0,761904762 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,190476 | 0 |
| 1 | 0,80952381 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,047619 | 0 |
| 1 | 0,857142857 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,047619 | 0 |
| 1 | 0,904761905 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,095238 | 0 |
| 1 | 0,952380952 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0,095238 | 0 |
| 1 | 1 | 0 | 0,5 | 0,386194 | 0,65861 | 1 | 0 | 0 |

Appendix 16

Appendix 16 presents the data set used to investigate Denmark.

The unit of analysis employed throughout the data set is the day.

List of acronyms and abbreviations:

gdpus: Gross Domestic Product (GDP) in US$ of the donor country under investigation
catastropheday: Day of the catastrophe (number of days elapsed since the onset of a selected natural disaster)
clgovernment: Centre-left government (presence or not of centre-left parties in government of donor country under investigation)
election: Election (presence or not of an electoral period in the donor country under investigation)
fatalities: Fatalities (number of fatalities recorded for the natural disaster under investigation)
affected: Affected (number of affected people recorded for the natural disaster under investigation)
damage: Damage (estimated damages recorded for the natural disaster under investigation)
totarticles: Total number of articles (total number of articles recorded on the natural disaster under investigation)
log_disburse: Logarithmic disbursement (logarithmic disbursement of emergency humanitarian assistance recorded)

Appendix 16

| gdpus | catastropheday | clgovernment | election | fatalities | affected | damage | totarticles | log_disburse |
|---|---|---|---|---|---|---|---|---|
| 0,056673374 | 0,047619048 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,056673374 | 0,095238095 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,272727 | 0 |
| 0,056673374 | 0,142857143 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,454545 | 0 |
| 0,056673374 | 0,19047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,545455 | 0 |
| 0,056673374 | 0,238095238 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,181818 | 0 |
| 0,056673374 | 0,285714286 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,454545 | 0,951131 |
| 0,056673374 | 0,333333333 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,272727 | 0 |
| 0,056673374 | 0,380952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,363636 | 0 |
| 0,056673374 | 0,428571429 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,454545 | 0 |
| 0,056673374 | 0,476190476 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,181818 | 0 |
| 0,056673374 | 0,523809524 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,090909 | 0 |
| 0,056673374 | 0,571428571 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,181818 | 0 |
| 0,056673374 | 0,619047619 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,056673374 | 0,666666667 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,056673374 | 0,714285714 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,090909 | 0 |
| 0,056673374 | 0,761904762 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,056673374 | 0,80952381 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,181818 | 0 |
| 0,056673374 | 0,857142857 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,056673374 | 0,904761905 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0,090909 | 0 |
| 0,056673374 | 0,952380952 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,056673374 | 1 | 1 | 1 | 0,088399 | 0,103659 | 0,030865 | 0 | 0 |
| 0,061368209 | 0,047619048 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,095238095 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,142857143 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,19047619 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,238095238 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,285714286 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,333333333 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |

Appendix 16

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,061368209 | 0,380952381 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,428571429 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,476190476 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,523809524 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,571428571 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,619047619 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,666666667 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,714285714 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,761904762 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,80952381 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,857142857 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,904761905 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,952380952 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 1 | 0 | 1 | 0,007404 | 1 | 0,059691 | 0 | 0 |
| 0,061368209 | 0,047619048 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0 | 0,652592 |
| 0,061368209 | 0,095238095 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,272727 | 0,767908 |
| 0,061368209 | 0,142857143 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,636364 | 0 |
| 0,061368209 | 0,19047619 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,363636 | 0 |
| 0,061368209 | 0,238095238 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,545455 | 0 |
| 0,061368209 | 0,285714286 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,272727 | 0 |
| 0,061368209 | 0,333333333 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,363636 | 0 |
| 0,061368209 | 0,380952381 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,636364 | 0 |
| 0,061368209 | 0,428571429 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,090909 | 0 |
| 0,061368209 | 0,476190476 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,272727 | 0,971351 |
| 0,061368209 | 0,523809524 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,545455 | 0,988125 |
| 0,061368209 | 0,571428571 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,636364 | 0 |
| 0,061368209 | 0,619047619 | 0 | 0 | 1 | 0,034835 | 0,117541 | 1 | 0 |
| 0,061368209 | 0,666666667 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,545455 | 0 |
| 0,061368209 | 0,714285714 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,545455 | 0 |

Appendix 16

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,061368209 | 0,761904762 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,545455 | 1 |
| 0,061368209 | 0,80952381 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,636364 | 0 |
| 0,061368209 | 0,857142857 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,818182 | 0 |
| 0,061368209 | 0,904761905 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,363636 | 0 |
| 0,061368209 | 0,952380952 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,454545 | 0 |
| 0,061368209 | 1 | 0 | 0 | 1 | 0,034835 | 0,117541 | 0,181818 | 0 |
| 0,063044936 | 0,047619048 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,095238095 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,142857143 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,19047619 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,238095238 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,090909 | 0 |
| 0,063044936 | 0,285714286 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,333333333 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,380952381 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,428571429 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0,090909 | 0 |
| 0,063044936 | 0,476190476 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,523809524 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,571428571 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,619047619 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,666666667 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,714285714 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,761904762 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,80952381 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,857142857 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,904761905 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,952380952 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 1 | 0 | 1 | 0,005558 | 0,286499 | 0,039176 | 0 | 0 |
| 0,063044936 | 0,047619048 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,063044936 | 0,095238095 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |

Appendix 16

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,063044936 | 0,142857143 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,063044936 | 0,19047619 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,063044936 | 0,238095238 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0,063044936 | 0,285714286 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0,063044936 | 0,333333333 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,063044936 | 0,380952381 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0,063044936 | 0,428571429 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0,063044936 | 0,476190476 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0,063044936 | 0,523809524 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0,063044936 | 0,571428571 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0,063044936 | 0,619047619 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,063044936 | 0,666666667 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0,841792 |
| 0,063044936 | 0,714285714 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0,063044936 | 0,761904762 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0,063044936 | 0,80952381 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,063044936 | 0,857142857 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,063044936 | 0,904761905 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,090909 | 0 |
| 0,063044936 | 0,952380952 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0,181818 | 0 |
| 0,063044936 | 1 | 0 | 1 | 0,007245 | 0,035998 | 0,045459 | 0 | 0 |
| 0,063044936 | 0,047619048 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0 | 0 |
| 0,063044936 | 0,095238095 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,363636 | 0 |
| 0,063044936 | 0,142857143 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,727273 | 0 |
| 0,063044936 | 0,19047619 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,727273 | 0 |
| 0,063044936 | 0,238095238 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,363636 | 0,730403 |
| 0,063044936 | 0,285714286 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,363636 | 0 |
| 0,063044936 | 0,333333333 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,272727 | 0 |
| 0,063044936 | 0,380952381 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,272727 | 0 |
| 0,063044936 | 0,428571429 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,454545 | 0 |
| 0,063044936 | 0,476190476 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,272727 | 0,906898 |

Appendix 16

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,063044936 | 0,523809524 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,272727 | 0 |
| 0,063044936 | 0,571428571 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,181818 | 0 |
| 0,063044936 | 0,619047619 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,454545 | 0 |
| 0,063044936 | 0,666666667 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,090909 | 0 |
| 0,063044936 | 0,714285714 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,545455 | 0 |
| 0,063044936 | 0,761904762 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,181818 | 0 |
| 0,063044936 | 0,80952381 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,181818 | 0 |
| 0,063044936 | 0,857142857 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,181818 | 0 |
| 0,063044936 | 0,904761905 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,090909 | 0 |
| 0,063044936 | 0,952380952 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,545455 | 0 |
| 0,063044936 | 1 | 0 | 1 | 0,329609 | 0,075745 | 0,072942 | 0,090909 | 0 |
| 0,066063045 | 0,047619048 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,066063045 | 0,095238095 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,545455 | 0 |
| 0,066063045 | 0,142857143 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,545455 | 0 |
| 0,066063045 | 0,19047619 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,363636 | 0 |
| 0,066063045 | 0,238095238 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,272727 | 0 |
| 0,066063045 | 0,285714286 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,066063045 | 0,333333333 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,090909 | 0 |
| 0,066063045 | 0,380952381 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,090909 | 0 |
| 0,066063045 | 0,428571429 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,090909 | 0 |
| 0,066063045 | 0,476190476 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,066063045 | 0,523809524 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,181818 | 0 |
| 0,066063045 | 0,571428571 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,066063045 | 0,619047619 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,066063045 | 0,666666667 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,066063045 | 0,714285714 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,066063045 | 0,761904762 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,066063045 | 0,80952381 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,066063045 | 0,857142857 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |

Appendix 16

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,066063045 | 0,904761905 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,090909 | 0 |
| 0,066063045 | 0,952380952 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0,090909 | 0 |
| 0,066063045 | 1 | 0 | 1 | 0,025509 | 0,045523 | 0,036471 | 0 | 0 |
| 0,068075117 | 0,047619048 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,068075117 | 0,095238095 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,181818 | 0 |
| 0,068075117 | 0,142857143 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0,068075117 | 0,19047619 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0,068075117 | 0,238095238 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0,068075117 | 0,285714286 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0,068075117 | 0,333333333 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0,068075117 | 0,380952381 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0,068075117 | 0,428571429 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0,068075117 | 0,476190476 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,068075117 | 0,523809524 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0,090909 | 0 |
| 0,068075117 | 0,571428571 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,068075117 | 0,619047619 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,068075117 | 0,666666667 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,068075117 | 0,714285714 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,068075117 | 0,761904762 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,068075117 | 0,80952381 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,068075117 | 0,857142857 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,068075117 | 0,904761905 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,068075117 | 0,952380952 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,068075117 | 1 | 0 | 1 | 0,018763 | 0,12902 | 0,028235 | 0 | 0 |
| 0,068075117 | 0,047619048 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,095238095 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,142857143 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,19047619 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,238095238 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |

Appendix 16

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,068075117 | 0,285714286 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,333333333 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,380952381 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,272727 | 0 |
| 0,068075117 | 0,428571429 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,090909 | 0 |
| 0,068075117 | 0,476190476 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,090909 | 0 |
| 0,068075117 | 0,523809524 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,571428571 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,619047619 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0,090909 | 0 |
| 0,068075117 | 0,666666667 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,714285714 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,761904762 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,80952381 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,857142857 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,904761905 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 0,952380952 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0 |
| 0,068075117 | 1 | 0 | 1 | 0,611166 | 0,045974 | 0,047282 | 0 | 0,998074 |
| 0,068075117 | 0,047619048 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,068075117 | 0,095238095 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,454545 | 0 |
| 0,068075117 | 0,142857143 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,454545 | 0 |
| 0,068075117 | 0,19047619 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,454545 | 0 |
| 0,068075117 | 0,238095238 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,181818 | 0 |
| 0,068075117 | 0,285714286 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,363636 | 0 |
| 0,068075117 | 0,333333333 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,181818 | 0 |
| 0,068075117 | 0,380952381 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,272727 | 0 |
| 0,068075117 | 0,428571429 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,181818 | 0 |
| 0,068075117 | 0,476190476 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,090909 | 0 |
| 0,068075117 | 0,523809524 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,181818 | 0 |
| 0,068075117 | 0,571428571 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,181818 | 0 |
| 0,068075117 | 0,619047619 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,090909 | 0 |

Appendix 16

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0,068075117 | 0,666666667 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,272727 | 0 |
| 0,068075117 | 0,714285714 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,454545 | 0 |
| 0,068075117 | 0,761904762 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,272727 | 0 |
| 0,068075117 | 0,80952381 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,181818 | 0 |
| 0,068075117 | 0,857142857 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0 | 0 |
| 0,068075117 | 0,904761905 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,363636 | 0 |
| 0,068075117 | 0,952380952 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,272727 | 0 |
| 0,068075117 | 1 | 0 | 1 | 0,386194 | 0,65861 | 1 | 0,272727 | 0 |