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Children's Opportunities in Germany – An Application Using Multidimensional Measures

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Abstract

Abstract. Single parents and unmarried couples are increasingly replacing the traditional nuclear family. This paper investigates if the greater variety in living arrangements contributes to increased resource disparities among children in Germany. Children in single parent families are disadvantaged in at least three dimensions decisive for their later achievements: material standard of living, parental education, and parental childcare time. We compute multidimensional inequality and poverty indices using SOEP data from 1991-2012. We distinguish between parental and publicly provided childcare, which is an increasingly important in-kind benefit in Germany. We find that both multidimensional inequality and poverty declined as expanded public childcare strongly reduces resource disparities among children.

JEL Classification: D30, D63, I32, J12, J13

Keywords: Multidimensional Inequality, Multidimensional Poverty, Inequality Indices, Demography

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1 Introduction

Single parents and non-marital cohabitations are increasingly replacing the traditional nuclear family in many industrialized countries.[1] The greater disparity in family environments most likely leads to greater disparity in children's resources, which are major predictors of later life socio-economic success.

This paper analyses if changing family patterns in Germany create greater disparities in children's endowments along three dimensions: (1) parental income; (2) parental education; (3) and care time; all crucial determinants of children's later outcomes. Higher parental income translates into higher expected earnings for their children via investments in health and education, as argued by Becker and Tomes (1979, 1986).[2] Parental education reflects parental productivity in child-enhancing activities (Black and Devereux, 2011). There is broad evidence for strong correlations between parental education and income, on the one hand, with their children's education and income later in life, on the other hand.[3] Finally, time investment affects the development of children's cognitive and social-emotional skills.[4] We include both parental childcare time and publicly provided childcare and school time. In many industrialized countries, large welfare states play an important role in "leveling the playing field" for children both through financial redistribution via progressive taxes and monetary benefits as well as the provision of public services, such as public education, childcare, and other in-kind benefits. Verbist and Matsaganis (2014) suggest that the redistributive impact of in-kind benefits is as large as that of monetary benefits, with their relative importance in social spending seeming to increase in European countries. Since 2005, the German welfare state heavily expanded publicly provided childcare, which might have counteracted growing disparities among

[1] See, e.g., McLanahan (2004)

[2] There was a rapidly growing theoretical literature on the relation of family behavior and the distribution of income and wealth in the 1970s and 1980s, among which Becker and Tomes (1979, 1986) are probably the best known contributions.

[3] The large literature on intergenerational mobility since the 1990s is summarized in Black and Devereux (2011) and Jenkins and Jäntti (2015).

[4] An extensive overview of empirical studies on the importance of certain early life conditions and the evidence on critical periods for shaping multiple life skills is provided by Heckman and Mosso (2014).

children.[5]

We apply Maasoumi's index for multidimensional inequality (Maasoumi, 1986, 1999) and poverty (Lugo and Maasoumi, 2008), where resources are first aggregated for each individual and then aggregated across individuals to arrive at a single index.[6] Maasoumi's proposition to first aggregate dimensions for each individual carries the benefit that low levels of one dimension can be compensated with high levels of another dimension at the individual level. E.g., lower net incomes, lower parental education and less parental time, which applies to the average child in a single parent family, may be at least partly compensated by publicly provided childcare.

We contribute to the growing literature on multidimensional inequality and poverty measurement, which promotes a shift from the sole focus on income to a broader concept of "well-being" by incorporating endowments along several dimensions into a single measure.[7] Our study is also related to the literature on equality of opportunity, which separates the influence on outcomes into circumstances beyond individual control and individual effort.[8] If people believe that inequality is caused by circumstances beyond individual control they are less willing to accept high inequality levels and support more redistribution (Fong, 2001; Corneo and Grüner, 2002). Niehues and Peichl (2014) find that a sizable share of total inequality in Germany and the US can be attributed to circumstances beyond individual control. We argue that our three dimensions are beyond the children's control.

Our main results are as follows. Both multidimensional inequality and poverty among children decreased between 1991 and 2012, despite changing family patterns. The decline is driven by expanded publicly provided childcare that reduced inequality along this dimension and more than offsets rising income inequality among children. The finding is robust to different assumptions on inequality and poverty aversion and to the degree of substitutability between dimensions. However, increasing

[5]According to Schober and Stahl (2014), the use of publicly provided childcare has disproportionately grown among single mothers and highly educated mothers since 2006.

[6]Further applications of Maasoumi's index include, e.g., Nilsson (2010); Justino (2012); Rohde and Guest (2013).

[7]Rawls (1971) and Sen (1985) first advocated a multidimensional perspective on the notion of well-being. See Aaberge and Brandolini (2015) for a summary and thorough discussion of the multidimensional approaches as well as the introduction of Decancq and Lugo (2013).

[8]The literature on equality of opportunity was pioneered by Roemer (1993, 1998).

the weight of income and decreasing the weight of publicly provided childcare takes away the declining trend in some cases.

The paper is organized as follows: In Section 2, we describe our data, sample and the measurement of (1) parental income; (2) parental education; as well as (3) parental and non-parental childcare time. Section 3 describes how these resources evolved over time by family type. The methodological approach deriving multidimensional inequality and poverty indices is described in Section 4. In Section 5, we present and discuss our results. Section 6 concludes.

2 Data

Our analysis is based on data from the Socio-Economic Panel (SOEP). The SOEP is an annual survey of German households that includes a variety of demographic and socio-economic characteristics for all years since 1984. East German households are included in the panel since 1990. By 2013, almost 11,000 households participated, which corresponds to approximately 20,000 individuals.[9]

Our sample includes East and West German children. Children are defined as individuals that are younger than 14 years and still live in the household of their parents.[10] We further differentiate between children living with married, cohabiting and single parents. We start the analysis with the year 1991 in order to include East German children that entered the sample after reunification in 1990. In order to maximize the sample size and to minimize problems like panel attrition, we use the original and all refreshment samples (A-K) of the SOEP in an unbalanced panel design excluding the migration sample from 2013. Furthermore, our sample is restricted to children, where values of all four attributes are observed, by which we lose about 2,500 observations from a total of about 77,000 observations over the entire period. In 2013, the sample includes about 3,000 observations.[11]

Children's resources are measured along three dimensions: (1) parental income;

[9]For further details see Wagner et al. (2007) and Gerstorf and Schupp (2015).

[10]Sensitivity tests show that our results are robust to restricting our sample to children younger than seven years.

[11]The number of observed children by family type is provided in Appendix Table A.1.

(2) parental education; (3) and care time.

1. *Parental income*

   Parental income is measured as real net equivalent household income. Net household income is the sum of households' labour earnings, asset flows, private retirement income, private transfers, public transfers, and social security pensions minus total household taxes including imputed rents from housing. Income is equivalized using the modified OECD scale to take into account different needs of adults and children in the household.

2. *Parental education*

   Parental education is measured as years of education completed at the time of the survey. For married and cohabiting parents, we use the value of the parent with the highest number of years of education.

3. *Childcare time*

   (a) *Parental childcare time*

   In contrast to many other surveys, where parental time can only be measured as a residual term, we are able to directly observe total time devoted to childcare activities by each parent: Every household member aged sixteen or older is asked the number of hours spent on childcare on an average weekday. Parental childcare time is the sum of hourly childcare activities of household head and spouse for all children on an average weekday. Unfortunately, we do not observe the type of childcare such that we cannot distinguish between physical and non-physical childcare (e.g. nourishing vs. teaching) or direct and indirect childcare (e.g. reading vs. doing household tasks together). Consequently, we can only measure quantity of childcare time and not quality. Empirical evidence shows that quality of childcare time depends on parents' educational level.[12] Higher

[12]E.g., Doyle et al. (2009) find that children of low-educated mothers tend to have lower achievements in tests measuring cognitive, socio-emotional and behavioural skills than children from high-educated families.

quality of childcare time might thus be captured by considering parental education as a separate dimension.

Since parents' only state the total time spend with children, we have to adjust total time to the number of children in the household. We assume that parents' caring time is not proportionally increasing with the number of children and that there are economies of scale in parenting within families. Evidence for this hypothesis is given by time use studies. In particular, Kühhirt (2012) shows that West German married and cohabiting parents do not spend significantly more time on childcare activities if there is more than one child living in the same household. To construct comparable *one child equivalent families* we apply a generalized version of the square root scale[13] on total parental childcare time, PT, of both parents ($i = 1, 2$) such that equivalent parental childcare time, PT_{eq} is defined as:

$$PT_{eq} = \frac{\sum_{i=1}^{2} \text{Parental time}_i}{s^{\theta}}, \tag{1}$$

where s is the number of siblings living in a household and θ is an *equivalence elasticity* (Bönke and Schröder, 2012). $\theta = 0.5$ produces the well-known square root equivalence scale. Dividing total parental childcare time by the number of children (this would be equal to $\theta = 1$) would most likely underestimate parental time devoted to each child in the presence of economies of scale in parenting. On the other hand, assigning the total parental time to each child in the family (this would be equal to $\theta = 0$), would certainly overestimate parental time per child.[14]

(b) *Non-parental childcare time*

Non-parental childcare time includes total hours spent in crib, kindergarten, after school care club, with a child-minder or in school on an

[13] We use the square root scale to consider the number of siblings only, in contrast to the modified OECD scale used for income which also considers the number of adults in the household.

[14] Our results on trends in parental childcare inequality are robust to changes of θ. Inequality levels vary in θ, but differences are not significant. Results are available from the authors upon request.

average weekday depending on the age of the respective child. Since the bulk of this care time is provided by the state and presumably only a small portion is spent with a private child-minder, we also refer to this dimension as publicly provided childcare time.

We only observe if children spent half- or full-day in the above mentioned institutions on an average weekday. According to information on public childcare provision, we assign four hours for half-day care and eight hours for full-day care. Since 2009 exact hours are asked in the SOEP questionnaire, but for consistency reasons we stick to our half-day and full-day categories.

Time in school is based on information from publications of the Standing Conference of the Ministers of Education and Cultural Affairs of the German Länder (*Kultusministerkonferenz der Länder*), where school hours taught per week are provided by class type, class level and federal state (*Bundesland*) for the 1992-2012 period. We take 1992 values for 1991, where no information is available. We assign school hours taught in elementary school to every child aged between six and ten in the respective *Bundesland* and year. The average of actually taught school hours over all lower secondary school types is assigned to every child aged between eleven and thirteen in the respective *Bundesland* and year.[15]

There exist large differences within and across regions and between private and public childcare and schools (Camehl et al., 2015). SOEP data only includes questions on the quality of publicly provided childcare for children in preschool age. Information on the attended school and its respective quality is not observed. Therefore, we might underestimate disparities in non-parental childcare time.

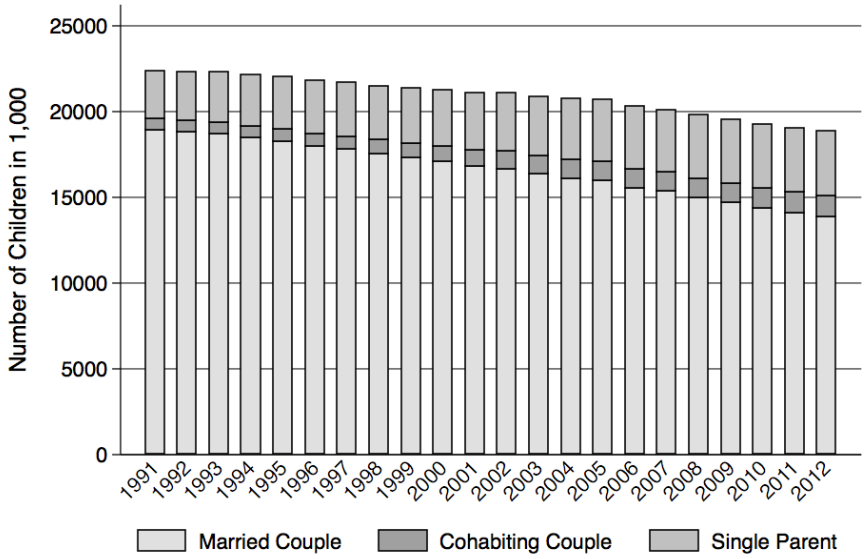
[15] We also incorporate the fact that primary school usually lasts until class level six in the federal states of Berlin and Brandenburg, in contrast to four years in the other federal states. We take averages over all lower secondary school types for each year because school types and hours taught in lower secondary schools vary heavily within and between *Bundesländer* over time. Secondary school types in Germany are *Hauptschule, Realschule, Gesamtschule, Schularten mit mehreren Bildungsgängen* and *Gymnasium*.

3 Trends in Family Resources in Germany

Since the mid-1960s, the traditional nuclear family consisting of a married couple and their respective children is on retreat. An increasing number of children grows up in comparably disadvantaged families with only one parent.[16]

As Figure 1 shows, the total number of children in Germany decreased from approximately 22 million in 1991 to 19 million in 2012. Over this period, the share of children living in traditional nuclear families decreased from 84.5 percent to 73.6 percent. At the same time, the share of children living in cohabiting couple families more than doubled increasing from 2.9 percent to 6.5 and the share of children in single parent families increased from 12.6 percent to 19.9 percent. In particular, the number of female-headed single parent households has risen sharply. In contrast, the number of children per family remained fairly constant.[17]

Figure 1: Trends in the number of children by family type



Source: Federal Statistical Office (2013, Table 6.5), own calculations.
Note: Values for the years 1991-1995 are not available and thus imputed using a linear trend.

Figure 2 depicts the average trends in Germany in each dimension by family

[16] A wide sociological and demographical literature examines the general trends and causes of the so-called second demographic transition for Western countries, e.g., Peuckert (2012), Lesthaeghe (2010), and McLanahan and Percheski (2008).

[17] The share of families with one child increased from 31.4 percent in 1991 to 33.4 percent in 2012, whereas the share of families with two (three or more) children declined from 46.2 (22.4) percent to 45 (21.6) percent.

type from 1991 to 2012. Graph 2a shows that children's average equivalent net income increased from 17,832 Euro to 21,223 Euro (+19 percent). Children living in traditional married couple families experienced both a higher level and a higher income growth rate than their counterparts in single parent families.[18] Consequently, the absolute income gap between children from married and cohabiting couple families on the one hand and children from single parent families on the other hand has widened.

Similarly, married and cohabiting couples exhibit, on average, more years of education than single parents, as can be taken from Graph 2b. However, although years of education increased for all family types, the education gap did not.

Parental childcare time depicted in Graph 2c replicates the pattern observed for parental income and education. Children in single parent families receive less care time from their parents. Of course, this gap is mostly explained by the total number of parents present in the family.[19] Equivalizing childcare time reduces the level of childcare time per child across all family types, as depicted in Graph 2d, but more so for children living in traditional married couple families due to the larger number of children living in this type of family. Average (equivalent) parental childcare time increased slightly from 8.0 (5.8) hours in 1991 to 8.6 (6.3) hours in 2012.[20]

Finally, Figure 2e shows that, in contrast to the other dimensions, the average child in a single parent family receives more non-parental childcare time than an average child living with married or cohabiting couple families. Average non-parental childcare time increased from 3.6 to 5 hours per day. A number of legislative changes expanded public childcare provision in Germany, particularly since 2005.[21] In some municipalities, special consideration is given to single parents. The observed trend

[18]Single parent families lack a second potential earner. Moreover, most single parents are females who have lower hourly wages and lower working hours than males.

[19]Single parents spend less time on childcare since they are not able to share housework with a partner and cannot reduce their working time being the only "breadwinner."

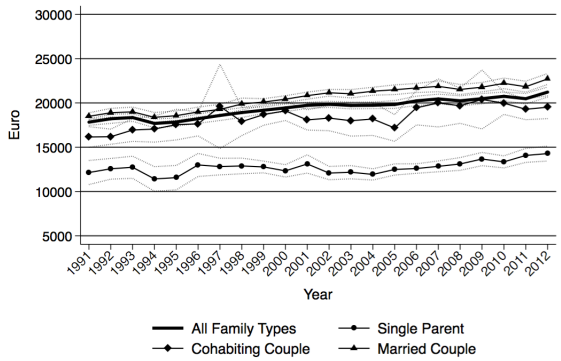
[20]See Section 2 for care time equivalization.

[21]A new law in 2004 introduced a legal claim for children under three years of age for a place in a day care center if certain conditions are met. Another law in 2008 redefined this claim for children older than one. Consequently, the share of children under three in day care centers increased from 8 to 24 percent in West Germany between 1991 and 2013, while remaining at roughly 50 percent in East Germany where the use of publicly provided childcare has a stronger tradition (Schober and Stahl, 2014).

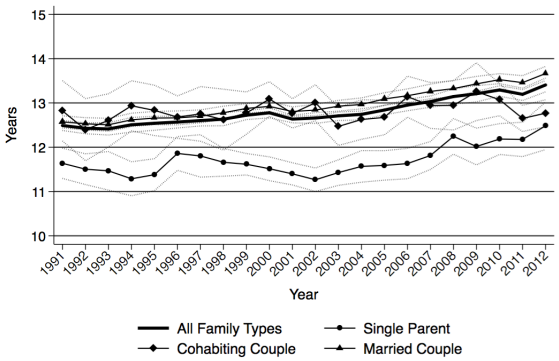
indicates that expanded public supply may at least partly offset single parent children's disadvantage in parental care time.

Figure 2: Average trends by dimension

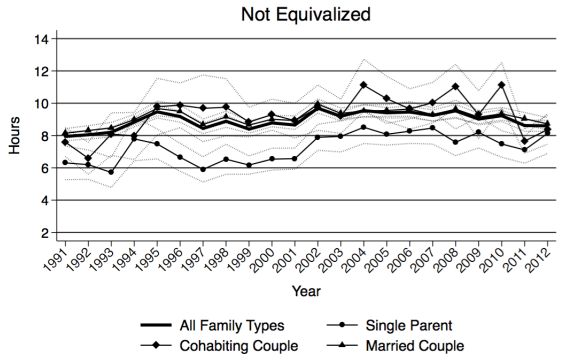
(a) Average equivalent net income



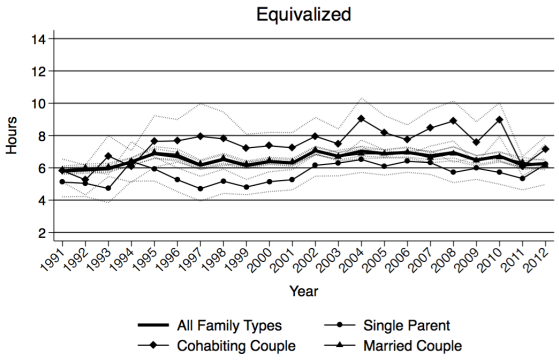
(b) Average years of parental education



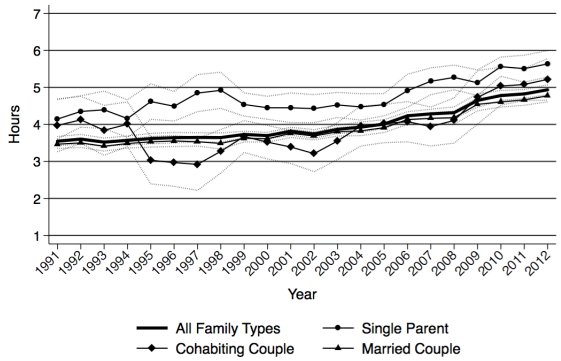
(c) Average parental childcare time



(d) Average parental childcare time



(e) Average non-parental childcare time



Source: SOEP (v30), own calculations.
Note: Incomes are in prices of 2010 and equivalized using the modified OECD scale. Education is measured as years of highest educated parent. Parental childcare time is the sum of household head's and spouse's stated childcare time on an average week day. Non-parental time is categorically coded (0,4, or 8). Significance at the five percent level is calculated using bootstrap standard errors with 100 replications. Higher volatility of the series for children in cohabiting couples is due to small sample sizes and relatively large variation of the respective sample size over time (see A.1).

4 Method

In this section, we explain and discuss how we measure inequality and poverty in a multidimensional setting.

First, we have to normalize the observed values x_{itd} for every child i, $i = 1, ..., N$, and dimension d, $d = 1, ..., D$, because of the dimensions' different measurement units, which are daily hours for childcare and schooltime, Euro for income and years for education. We transform observed values x_{itd} to values between zero and one for all observation years t, where the dimension-specific maximum and minimum over all years t serve as so-called *goalposts* (see, e.g., United Nations Development Programme, 2014).[22] Transformed values $\tilde{x}_{itd}$ are obtained by the following formula:

$$\tilde{x}_{itd} = \frac{x_{itd} - \min x_d}{\max x_d - \min x_d}. \tag{2}$$

After normalization, we replace all zero observations with 0.001, since GE measures of inequality are not defined for zero values.[23]

Most importantly, an aggregation rule that transforms the dimensions' distributions into a single real value has to be decided upon.[24] One approach is to first aggregate across children for each single dimension and second aggregate the dimension-specific indicators. This approach is easily applicable if only aggregates are available by dimension and, thus, forms the basis for the UN's Human Development Index (HDI). If individual data are available for each dimension, the joint distribution can be taken into account and potentially compensating effects between dimensions can be considered for each child. Then, as suggested by Maasoumi (1986, 1999), dimensions are first aggregated for each individual using a utility-like function

[22]The goalpost approach is a linear transformation that is used, for instance, to construct the Human Development Index. Of course, the transformation affects the inequality measured in each dimension, but, so far, standardization offers the best solution how to overcome different measurement units. See Decancq and Lugo (2013) for details on standardization procedures.

[23]Sensitivity tests show that our results are robust to choosing values closer to zero. Results are available from the authors upon request.

[24]The problem of choosing an appropriate well-being index including the selection of dimensions, substitution rates between each pair of dimensions, dimension weights etc., is also known as Rawl's index problem (Rawls, 1971, p. 80).

and then a univariate inequality measure is employed to aggregate the utility-like values across individuals. Maasoumi's index is an "ad-hoc" measure as compared to an axiomatic approach. The "ad-hoc" chosen parameter values make value judgments, e.g., the degree of substitutability between the dimensions and the weight of each dimension, explicit and transparent.[25]

In the first step, every child's observed endowments $\tilde{x}_{id}$ – suppressing time index t – are aggregated using aggregation function S_i, which can be interpreted as some utility-like function used to rank alternative distributions according to their social desirability (see Weymark, 2006). In our context, it measures a child's opportunities incorporating disposable income, parents' educational background and care time into a single measure. According to Maasoumi (1986) the optimal aggregation function S_i minimizes the distance between the joint distribution of the resources and the distribution of the index under the condition $\sum_{i=1}^{N} S_i = 1$ such that:

$$S_i = \big(\sum_{d=1}^{D} w_d \tilde{x}_{id}^{\beta}\big)^{1/\beta},\ \beta \neq 0, \tag{3}$$

$$S_i = \big(\prod_{d=1}^{D} \tilde{x}_{id}^{w_d}\big),\ \beta = 0. \tag{4}$$

In the second step, the utility-like function S_i to which we will refer to as opportunity indicator is aggregated to arrive at a measure of multidimensional inequality (Section 4.1) and of multidimensional poverty (Section 4.3).

4.1 Multidimensional Inequality

Maasoumi (1986, 1999) proposes a measure from the General Entropy (GE) family for the inequality of the distribution of $S = (S_1, ..., S_N)$. We can derive the following GE specifications to get a measure of multidimensional inequality I_α, where $\bar{S} =$

[25]Maasoumi's index satisfies the desirable properties for measuring multidimensional inequality: monotonicity, continuity, normalization, anonymity, homotheticity, subgroup decomposability, weak uniform majorization as well as individualism. See, e.g., Tsui (1999), Lugo (2007) or Weymark (2006) for a comprehensive discussion on desirable distributional and non-distributional properties of multidimensional inequality measures.

$\sum_{i=1}^{N} S_i/N$ is the average of the aggregated well-being indicator for N children:

			GE inequality measure I_α	
GE	$(\alpha \neq 0, 1)$	=	$\frac{1}{\alpha(1-\alpha)} \frac{1}{N} \sum_{i=1}^{N} \left[1 - \left(\frac{S_i}{\bar{S}} \right)^{\alpha} \right]$	(5)
MLD	$(\alpha = 0)$	=	$\frac{1}{N} \sum_{i=1}^{N} \ln \left(\frac{\bar{S}}{S_i} \right)$	(6)
Theil	$(\alpha = 1)$	=	$\frac{1}{N} \sum_{i=1}^{N} \left[\frac{S_i}{\bar{S}} \ln \left(\frac{S_i}{\bar{S}} \right) \right]$	(7)
HSCV	$(\alpha = 2)$	=	$-\frac{1}{2N} \sum_{i=1}^{N} \left[1 - \left(\frac{S_i}{\bar{S}} \right)^{2} \right]$	(8)

The magnitude of multidimensional inequality measured crucially depends on the chosen weighting structure w (1), the substitutability between dimensions β (2), and the inequality aversion parameter α (3). We elaborate on the weighting structure in Section 4.4.

The parameter β determines the degree of substitution between all pairs of dimensions. If $\beta = 1$, then all dimensions are perfect substitutes, i.e., low levels of one dimension can be perfectly compensated by high levels of another. The smaller β, the smaller is the substitutability between the dimensions, i.e., the loss of one unit in one dimension can only be compensated by ever more extra units in another dimension to keep the level of well-being constant. If β converges to minus infinity, then dimensions are treated as perfect complements and the opportunity indicator depends on the dimension where the child is worst off regardless of the chosen weighting structure.

The parameter α determines the degree of concavity of the inequality measure and indicates to what extent a society values the well-being of some individuals in the distribution different from others. The lower α, the more weight is put on individuals at the bottom of the distribution and, thus, the more sensitive is the inequality measure to changes in the lower part of the distribution. The Mean Logarithmic Deviation (MLD), where $\alpha = 0$, is thus more sensitive to changes at the bottom than the Theil, where $\alpha = 1$, or the Half Squared Coefficient of Variation (HSCV), where $\alpha = 2$.

4.2 Decomposition of Multidimensional Inequality

To further investigate the relationship between changing family patterns and our measure for children's opportunity, we decompose the intertemporal change in multidimensional inequality by family type. Using inequality measures from the GE family in the second step of our multidimensional framework, we can additively decompose the changes in multidimensional inequality into a within group and a between group component (see Shorrocks, 1980; Maasoumi, 1986). In particular, we can decompose the MLD denoted as I_0, which is the only path independent inequality measure of that class (see Foster and Shneyerov, 2000), as follows:

$$I_0 = \underbrace{\sum_{f=1}^{F} v_f I_{0f}}_{within} + \underbrace{\sum_{f=1}^{F} v_f \ln\left(\frac{1}{\lambda_f}\right)}_{between}. \tag{9}$$

F is the number of family types, $v_f = n_f/n$ is the population share of family type f, I_{0f} is the family type specific level of multidimensional inequality measured by MLD, and $\lambda_f = \bar{S}_f/\bar{S}$ reflects family type f's average opportunities relative to the overall opportunity average. Since we are particularly interested in the impact of changing family patterns on the change in multidimensional inequality over time, we decompose the inequality change $\Delta I = I_{t+1} - I_t$, suppressing the GE index α, according to Mookherjee and Shorrocks (1982) as follows:

$$\Delta I = \sum_{f=1}^{F} v_{f,t+1} I_{f,t+1} - \sum_{f=1}^{F} v_{f,t} I_{f,t} - \sum_{f=1}^{F} v_{f,t+1} \ln(\lambda_{f,t+1}) + \sum_{f=1}^{F} v_{f,t} \ln(\lambda_{f,t}). \tag{10}$$

Extending both sides by $\sum_{f=1}^{F} v_{f,t} I_{f,t+1}$ and $\sum_{f=1}^{F} v_{f,t} \ln(\lambda_{f,t+1})$, rearranging and denoting differences between $t+1$ and t by Δ gives:

$$\Delta I = \sum_{f=1}^{F} v_{f,t} \Delta I_f + \sum_{f=1}^{F} \Delta v_f I_{f,t+1} - \sum_{f=1}^{F} \Delta v_f \ln(\lambda_{f,t+1}) - \sum_{f=1}^{F} v_{f,t} \Delta \ln(\lambda_f). \tag{11}$$

$v_{f,t}, I_{f,t+1}$ and $\ln(\lambda_{f,t+1})$ are replaced by their mean values (e.g., $\bar{v}_f = \frac{1}{2}[v_{f,t} + v_{f,t+1}]$) in order to avoid aggregating weights from different points in time which gives:

$$\Delta I = \sum_{f=1}^{F} \bar{v}_f \Delta I_f + \sum_{f=1}^{F} \bar{I}_f \Delta v_f - \sum_{f=1}^{F} \overline{\ln(\lambda_f)} \Delta v_f - \sum_{f=1}^{F} \bar{v}_f \Delta \ln(\lambda_f). \tag{12}$$

The first term gives the impact of the change in within family type inequality ΔI_f on the overall inequality change. However, the change in relative importance of family types Δv_f affects not only the two middle terms but also the last term through $\lambda_f = \bar{S}_f/\bar{S}$ because of $\bar{S} = \sum_{f=1}^{F} v_f \bar{S}_f$. Since we want to exactly identify the effect of Δv_f on the overall inequality change, we rearrange the last term in Equation (12) and then approximate the decomposition according to Mookherjee and Shorrocks (1982) as:

$$\Delta I \approx \underbrace{\sum_{f=1}^{F} \bar{v}_f \Delta I_f}_{(1)} + \underbrace{\sum_{f=1}^{F} \bar{I}_f \Delta v_f}_{(2)} + \underbrace{\sum_{f=1}^{F} \left[\bar{\lambda}_f - \overline{\ln(\lambda_f)}\right] \Delta v_f}_{(3)} + \underbrace{\sum_{f=1}^{F} \left(\bar{\theta}_f - \bar{v}_f\right) \Delta \ln(\bar{S}_f)}_{(4)}, \tag{13}$$

where $\theta_f = v_f \bar{S}_f / \bar{S}$ is the family type's share of total population's well-being. We can now clearly distinguish between the impact of changes in (1) within family inequality and (4) between family inequality, as well as the impact of changing relative importance of family types on the (2) within and (3) between family type inequality.

4.3 Multidimensional Poverty

In the view of policy implications, we might be particularly interested in the lower part of the distribution. Therefore, we also compute measures of multidimensional poverty. To stay as close as possible to our methodological framework for inequality presented above, we focus on a multidimensional poverty measure based on infor-

mation theory introduced by Lugo and Maasoumi (2008).[26]

As for multidimensional inequality, we start with each child's utility-like function S_i (see equations (3) and (4)) covering the endowments in all dimensions. But to identify the children with poor opportunities we must decide on a poverty line.

One can either use dimension-specific poverty thresholds before aggregation (*component poverty line approach*) or an aggregate poverty line derived from dimension-specific poverty lines (*aggregate poverty line approach (APL)*). Since we aggregate dimensions in the first step, we construct an APL, which we denote S_z, from dimension-specific poverty lines z_d. The dimension-specific poverty lines z_d are defined as 60 percent of the median value in each dimension. E.g., children are identified as income poor if they have 60 percent of the median real equivalent net income or less. To obtain S_z we simply replace the $\tilde{x}_{id}$ in (3) and (4) with the dimension-specific poverty lines z_d:

$$S_z = \left(\sum_{d=1}^{D} w_d z_d^{\beta} \right)^{1/\beta}, \quad \beta \neq 0, \tag{14}$$

$$S_z = \prod_{d=1}^{D} z_d^{w_d}, \quad \beta = 0. \tag{15}$$

Children with an opportunity indicator S_i below the aggregate poverty line S_z are identified as poor in opportunities.[27]

Then, we aggregate the level of well-being of children identified as poor with the following function

[26] See, e.g., Bourguignon and Chakravarty (2003) or Alkire and Foster (2011) for a detailed discussion of counting and multidimensional poverty measures including differences in identifying the poor (union, intersection or dual cutoff methods).

[27] According to the union approach, an individual is already identified as multidimensional poor if she is deprived at least in one dimension. The intersection approach identifies an individual as multidimensional poor if it is deprived in all dimensions at the same time (see, e.g., Alkire and Foster, 2011). In contrast, we apply an intermediate approach that allows for some substitution between dimensions such that disadvantages in one or more dimensions can be compensated by advantages in other dimensions in which an individual is not deprived (Lugo and Maasoumi, 2008). However, the poverty function collapses to the union approach if β is infinitely small such that only the worst dimension is considered in S_i.

$$P(S;z) = \frac{1}{N}\sum_{i=1}^{N} p_i^{\phi} = \frac{1}{N}\sum_{i=1}^{N}\left[\max\left\{\frac{S_z - S_i}{S_z};0\right\}\right]^{\phi}, \tag{16}$$

where p_i is the multi-attribute poverty function for each child i. Our poverty measure is directly related to the Foster-Greer-Thorbecke (FGT) poverty measures and satisfies the same distributional and non-distributional properties. A general formulation that allows for some substitution between dimensions above and below the poverty thresholds can be written as

$$P(APL) = \frac{1}{N}\sum_{i=1}^{N}\left[\max\left\{\frac{S_z^{1/\beta} - S_i^{1/\beta}}{S_z^{1/\beta}};0\right\}\right]^{\phi},\ \beta \neq 0. \tag{17}$$

The magnitude of poverty measured crucially depends on the choice of the parameters w, β and ϕ. Note that a higher ϕ in FGT poverty measures indicates higher poverty aversion putting more weight on the children identified as poor.

4.4 Weights

The weighting structure w determines the trade-off between any pair of dimensions and reflects value judgments on which factors are viewed as more important than others for children's later achievements. We apply three methods to check the robustness of our findings to the chosen weights.[28]

First, we assign equal weights to all dimensions following an agnostic approach. Equal weighting is widely used in empirical works on multidimensional inequality and poverty, e.g., in the Human Development Index.

Second, we employ a data-driven approach and calculate frequency-based weights following Cheli and Lemmi (1995). The weights w_d are defined as

[28]Deutsch and Silber (2005) describe various methods to set weights in a multidimensional framework. Decancq and Lugo (2013) comprehensively discuss the issue of weight setting in a multidimensional framework and compare the advantages and disadvantages of three existing approaches: (1) data-driven; (2) normative; and (3) hybrid. Overall, there is no unifying theoretical framework that argues in favor of one specific weighting scheme. Both studies rather conclude to rely on reasonable trade-offs between dimensions and to perform a series of robustness checks and sensitivity analyses to control for the impact of different weighting schemes on the respective results.

$$w_d = \ln(\frac{1}{P_d}) / \sum_{d=1}^{D} \ln(\frac{1}{P_d}),$$

where P_d is the dimension-specific headcount ratio. Accordingly, the weights w_d are an inverse function of the average degree of deprivation; the lower the share of deprived children in one dimension, the greater the weight of the respective dimension.

Third, we gradually increase the weight of income from 1/4 to 9/10 and proportionally reduce the weight of the other dimensions checking if level and trends in multidimensional inequality and poverty change.

5 Results

We first present results how inequality of each dimension evolved between 1991 and 2012. Then we present and discuss the results from our multidimensional analysis.

5.1 Univariate Inequality and Poverty

Univariate inequality in each dimension measured by the MLD is given in Figure 3. Income and parental time inequality significantly increased between 1991 and 2012 (Figures 3a and 3c).[29] In contrast, inequality of parental education did not change significantly (Figure 3b), while publicly provided childcare time decreased significantly (Figure 3d). However, differences in inequality levels across dimensions depend on the inequality measure: Inequality of non-parental time is by far the highest when measured by the MLD.[30] Non-parental time inequality decreases in the 2000s when several policy initiatives were enforced to increase the provision of

[29]Prior research shows that changing family structures have actually led to an increase in family income inequality. E.g., Danziger and Gottschalk (1993) find that 13 percent of the increase in U.S. family income inequality among the white population between 1969 and 1987 was due to changing family structures, the rise in female-headed single parent families in particular. Peichl et al. (2012) show that decreasing average household size in Germany between 1991 and 2007 is associated with increasing income inequality.

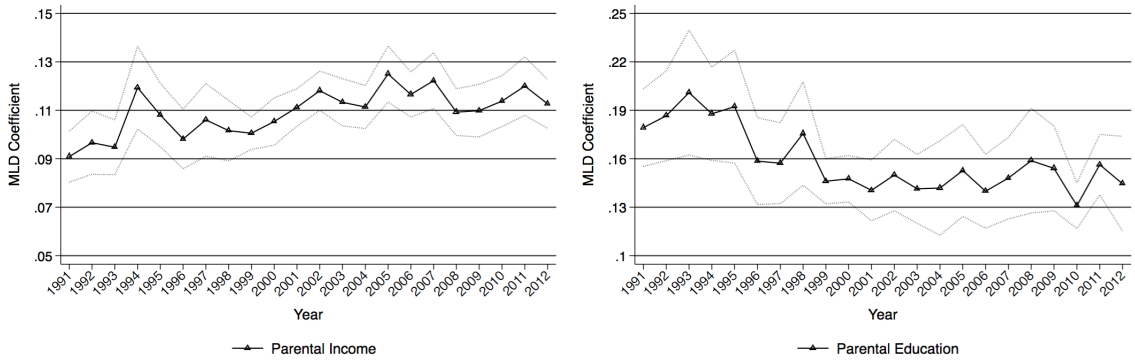
[30]Appendix Figure A.1 shows that inequality of non-parental time is similarly unequal as parental time when measured by the Gini. The share of children receiving zero non-parental childcare time declined from more than 30 percent in 1991 to less than 15 percent in 2012 which is more reflected by the MLD than by the Gini.

public childcare in Germany, especially for children under the age of three.

Figure 3: Inequality by dimension

(a) Parental income

(b) Parental education



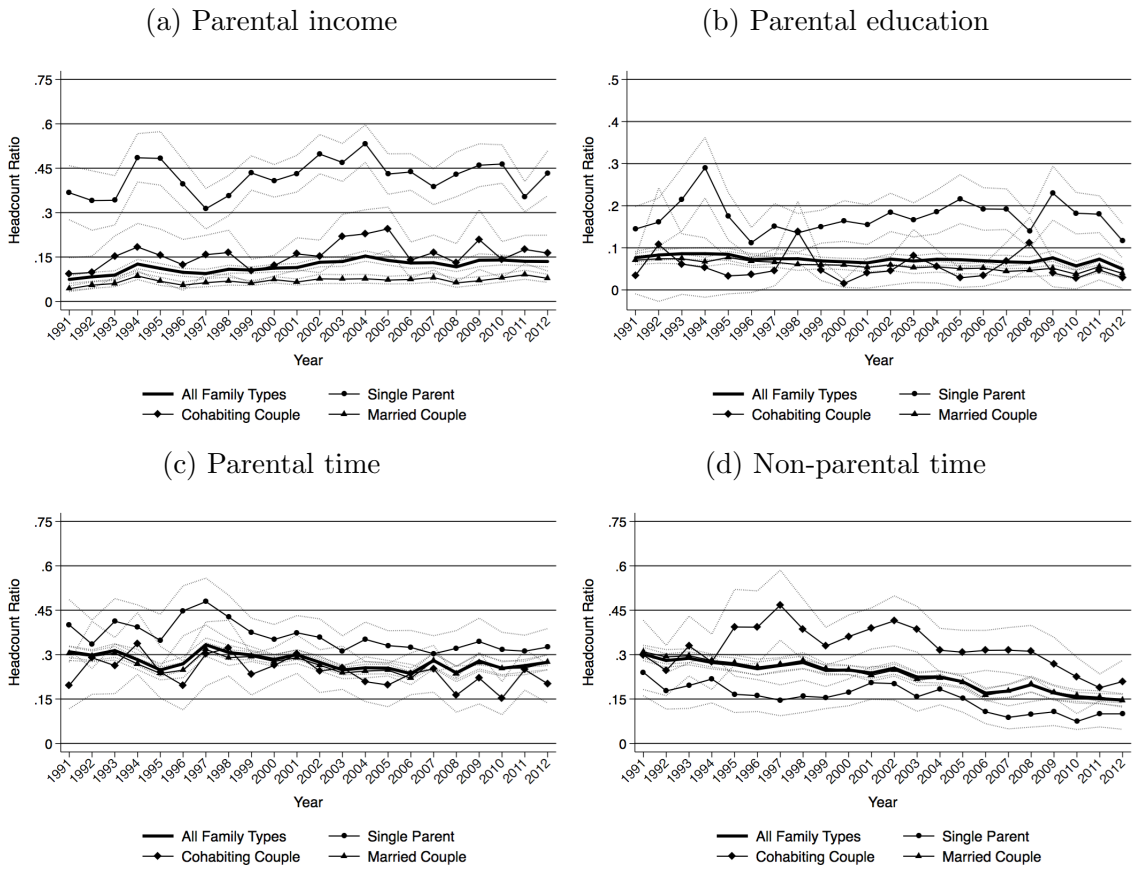
(c) Parental time

(d) Non-parental time

Source: SOEP (v30), own calculations.
Note: Parental time is equivalized according to the number of children in the family. Significance at the five percent level is calculated using bootstrap standard errors with 100 replications.

The headcount ratio presented in Figure 4 shows the share of children by family type counted as poor in one dimension, i.e. their resource level is lower than 60 percent of the median. As we see for average numbers in Section 3, children living in single parent households are disadvantaged in parental income (Figure 4a), parental education (Figure 4b), and parental time (4c), but are better off with respect to non-parental childcare time (Figure 4d). About 40 percent of single parents' children is considered as income poor, contrasting to an overall income poverty risk between 7 and 14 percent in 1991 and 2012. The overall share of children with publicly provided time lower than 60 percent of the median sharply decreased over time. Interestingly, children living with cohabiting couples seem the least likely to spend much time in publicly provided childcare.

Figure 4: Poverty risk by dimension



Source: SOEP (v30), own calculations.
Note: Parental time is equivalized according to the number of children in the family. Significance at the five percent level is calculated using bootstrap standard errors with 100 replications.

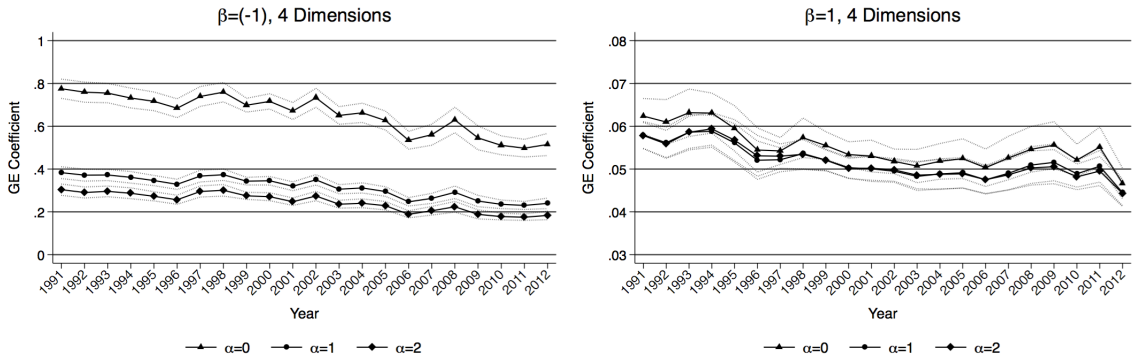
5.2 Multidimensional Inequality

Our results in Section 3 and 5.1 suggest that children living in single parent families are disadvantaged in parental income, parental education and parental time, but single parents make more use of publicly provided childcare time. The analysis of multidimensional inequality allows us to draw conclusions if disadvantages in one dimension are compensated by advantages in another at the individual level. Growing univariate inequality might be less of a concern if these dimensions indeed compensate each other and multidimensional inequality does not icrease. In our baseline scenario, we consider parental care time and publicly provided care time as separate dimensions since it can hardly be argued that they should be added up and, hence, treated as perfect substitutes.[31]

[31]Instead, it seems to depend on the perceived quality of parental childcare time, whether one type of care should be preferred over the other.

All in all, multidimensional inequality significantly declines between 1991 and 2012, which is largely driven by the expansion of publicly provided childcare. In the following, we vary each of the "ad-hoc" chosen parameters of the Maasoumi index and check the robustness of the declining trend in the view of reasonable parameter values. Figure 5 shows that the decline is robust to degrees of inequality aversion between 0 and 2, which is the interval empirically agreed on.[32] This applies to assuming dimensions to be complements (left-hand graph) or perfect substitutes (right-hand graph).

Figure 5: Multidimensional inequality with varying degrees of inequality aversion



Source: SOEP (v30), own calculations.
Note: Significance at the five percent level is calculated using bootstrap standard errors with 100 replications.

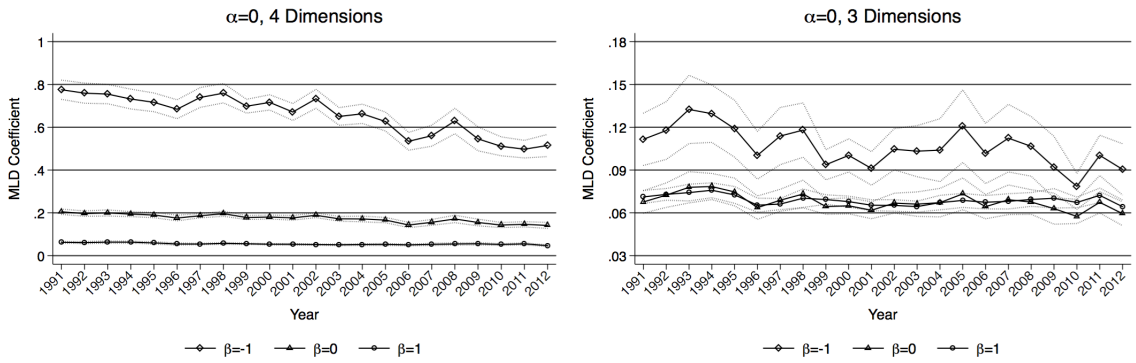
The declining trend persists for different degrees of substitutability between our four dimensions as shown by the left-hand graph in Figure 6. Even if we assume that all dimensions are perfectly substitutable, the declining trend remains but is smaller in size. However, the assumption of perfect substitutability seems rather far-fetched: One unit less parental time is most likely not perfectly compensated by one unit more income.[33] In contrast, one could argue that among our dimensions parental time and non-parental time are closest to being perfect substitutes. The right-hand graph of Figure 6 shows multidimensional inequality if we collapse both childcare time measure into one dimension and, consequently, end up with three dimensions in total. The declining trend is robust to different degrees of substitutability between

[32]See Aaberge and Brandolini (2015) or Lambert et al. (2003) for an overview on studies that either estimate α, e.g., through the elasticity of marginal social utility of income, or use parameter ranges that seem theoretically plausible. Values vary between zero and three.

[33]For $\beta < 1$, the utility-like function is a concave function and reflects a preference for a more equal vector of (transformed) achievements (Decancq and Lugo, 2013).

the three dimensions, but changes are no longer significant for all years. With equal weighting, income now receives a weight of 1/3 and non-parental childcare a weight of 1/6 such that the equalizing effect of non-parental time is deemphasized.

Figure 6: Multidimensional inequality with varying degrees of substitution



Source: SOEP (v30), own calculations.
Note: Significance at the five percent level is calculated using bootstrap standard errors with 100 replications.

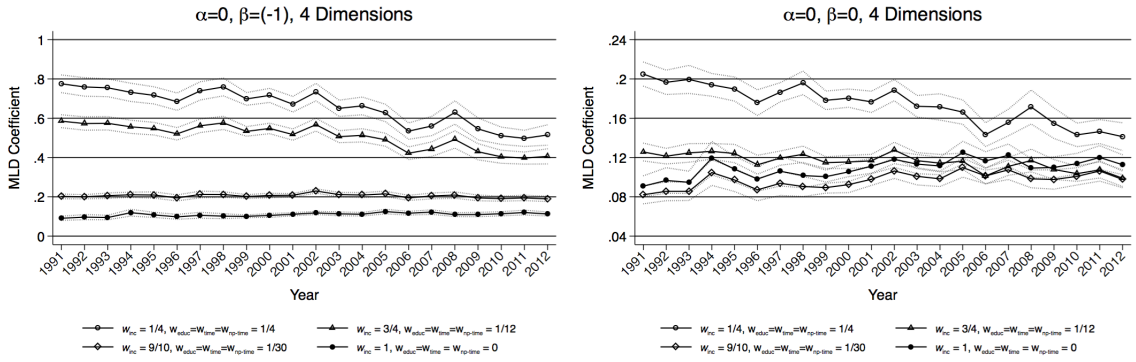
As a robustness check, we also computed multidimensional inequality using frequency-based weights. We broadly find the same trends and significance levels as for equal weighting.[34]

So far we find that multidimensional inequality has decreased since the beginning of the 1990s and that this result is quite robust against different parameter settings. But how sensitive is the multidimensional inequality index to increasing the income weight, where univariate inequality increased over the past two decades. Figure 7 shows how our multidimensional index of inequality changes, if we gradually increase the weight of income towards unity under the restriction that the remaining three dimensions are equally weighted and that all dimensions sum up to one. Assuming a low degree of substitutability ($\beta = -1$) in the left-hand graph, we still find a decline in multidimensional inequality even when weighting income by 90 percent. Assuming a slightly higher degree of substitutability ($\beta = 0$) in the right-hand graph the trend reverses when weighting income by 90 percent.

Finally, we check if our results are indeed driven by the expansion of publicly provided childcare. Figure 3 shows that non-parental childcare time became more equally distributed over the time period under study. In fact, the declining trend

[34]Figures A.2 are in Appendix.

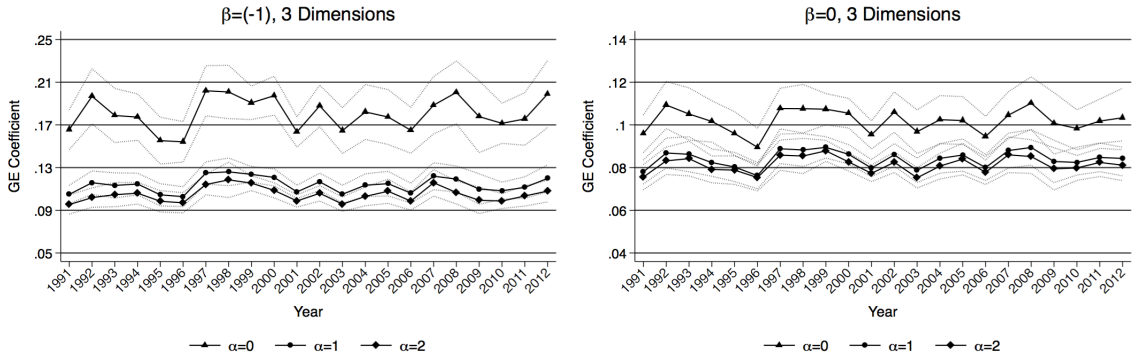
Figure 7: Multidimensional inequality with varying income weights



Source: SOEP (v30), own calculations.
Note: Significance at the five percent level is calculated using bootstrap standard errors with 100 replications.

disappears once we exclude publicly provided childcare and consider only the three other dimensions as shown in Figure 8.

Figure 8: Multidimensional inequality excluding non-parental childcare time



Source: SOEP (v30), own calculations.
Note: Significance at the five percent level is calculated using bootstrap standard errors with 100 replications.

5.3 Decomposition of Multidimensional Inequality by Family Type

We now turn to the impact of increasing non-traditional families on children's multidimensional inequality between 1991 and 2012. Table 1 depicts to what extent the total change in multidimensional inequality given in the second column can be attributed to changes in the four components: changing inequality (1) within family types; (4) changing inequality between family types; and the effect of changing family patterns on (2) within and (3) between family type inequality. The observed

decrease in multidimensional inequality tends to be higher for low degrees of substitutability. Reduced inequality within family types, (1), is the main explanatory component. In contrast, inequality changes between family types, (4), as well as family type's share on within, (2), and between, (3), family type inequality only negligibly contribute to the decline in multidimensional inequality and signs are not robust to different time period specifications.

Table 1: Multidimensional inequality (MLD) decomposition by family type, 1991-2012

		Absolute % Change in I_0 due to			
				Family Structure	
β	Total (ΔI_0 in %)	Within I_0 (1)	Between I_0 (4)	Within I_0 (2)	Between I_0 (3)
(-10)	-33.26	-33.55	0.12	0.08	0.09
(-1)	-33.84	-34.15	0.03	0.26	0.01
0	-31.89	-32.49	0.03	0.78	-0.21
0.5	-29.39	-29.30	-0.09	0.64	-0.64
1	-27.17	-25.83	-0.06	-0.41	-0.87

Source: SOEP (v30), own calculations.
Note: Differences between ΔI_0 in % and the sum of components are due to rounding (after computation).

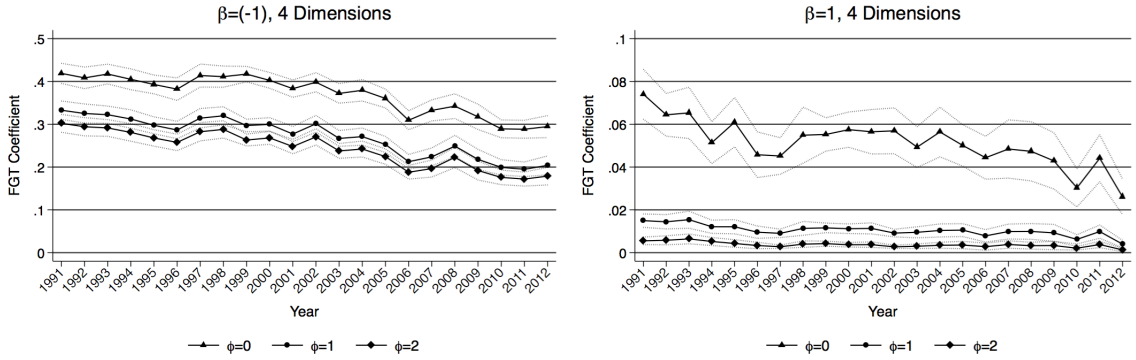
5.4 Multidimensional Poverty

The decline of multidimensional inequality may be due to losses of the better-off children or due to gains of children at the bottom of the opportunity indicator distribution. One might argue that a combination of multiple deprivations in attributes necessary for success later in life reduces children's opportunities even more than just the sum of each. To uncover the changes for those in the bottom of the multidimensional distribution, we now turn to the trends of multidimensional poverty. We also find a decline in multidimensional poverty, which is similarly robust to different parameter values and dimension specifications.

Figure 9 shows multidimensional poverty trends for three different poverty measures, which are headcount ratio ($\phi = 0$), poverty gap ($\phi = 1$), and poverty intensity ($\phi = 2$). All poverty measures exhibit a significant decline between 1991

and 2012.

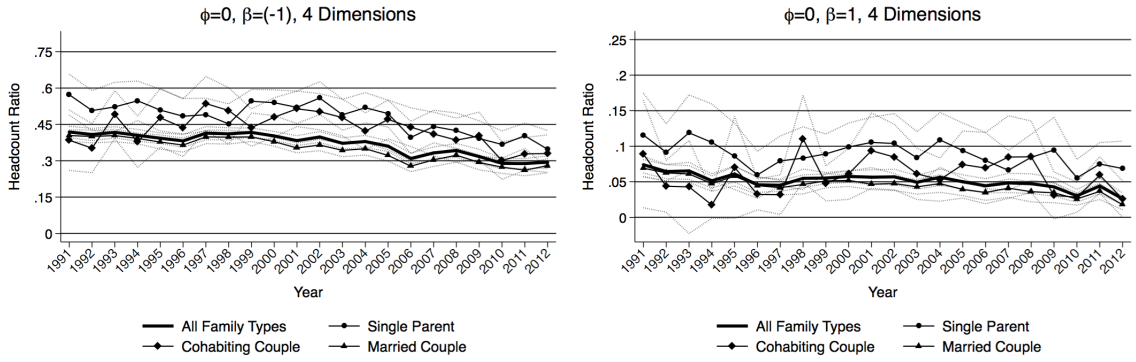
Figure 9: Multidimensional poverty measures



Source: SOEP (v30), own calculations.
Note: Significance at the five percent level is calculated using bootstrap standard errors with 100 replications.

As Figure 10 depicts, differentiating between family types reveals a higher multidimensional poverty risk for children from single parent families compared to children from married and cohabiting families. Nevertheless, for both low and high degrees of substitutability we find a considerable decline in multidimensional poverty across all family types and the gap between them has become smaller over time.

Figure 10: Multidimensional poverty by family type

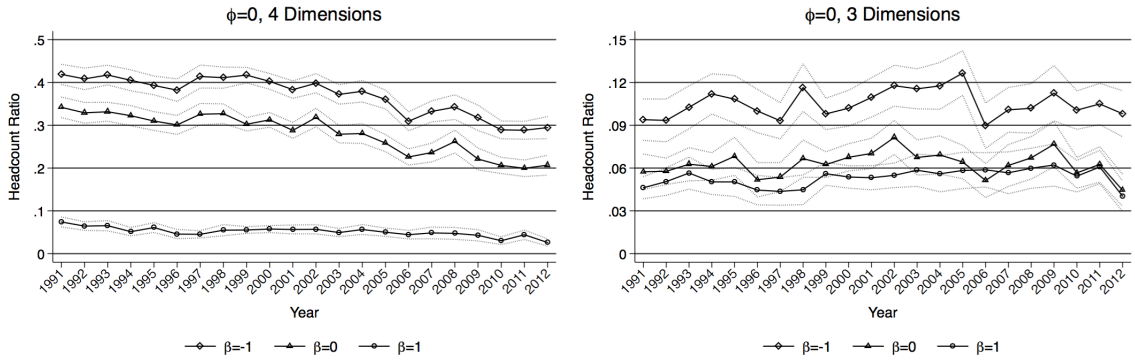


Source: SOEP (v30), own calculations.
Note: Significance at the five percent level is calculated using bootstrap standard errors with 100 replications.

The poverty decline is robust to different assumptions on the substitutability between dimensions as can be taken from the left-hand graph of Figure 11. The level of multidimensional poverty increases in the assumed degree of substitution between dimensions. If we assume perfect substitutability ($\beta = 1$), our measure for children's opportunities is a simple arithmetic mean of all dimensions. One unit less income can be perfectly offset by more parental time. However, this assumption

does not appear very realistic. The more complementary the dimensions, the heavier is the effect of the worst dimension on the individual opportunity indicator and the higher is the number of deprived children. The declining trend mostly disappears if we sum up parental and non-parental childcare time to one dimension as shown in the right-hand graph of Figure 11. Again, this occurs because of the new weighting structure: when time is collapsed into one dimension, the weight of each dimension is halved in comparison to education and income. In contrast, multidimensional inequality still slightly declined for this setting, but not significantly anymore.

Figure 11: Multidimensional poverty with varying degrees of substitution

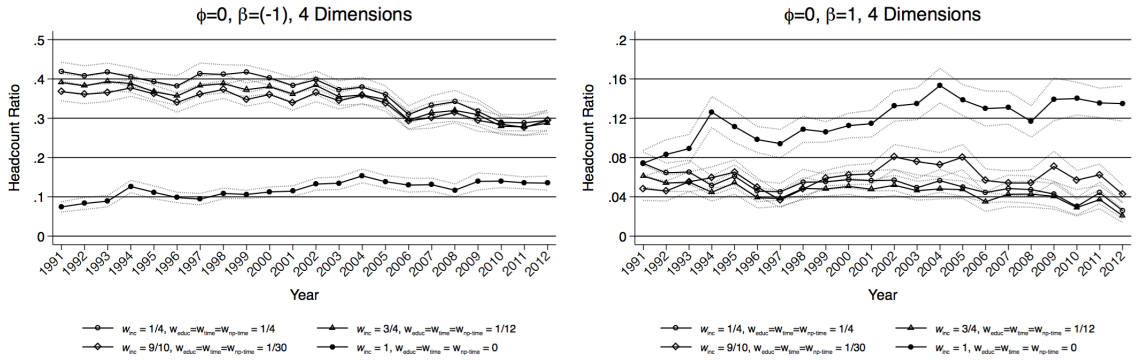


Source: SOEP (v30), own calculations.
Note: Significance at the five percent level is calculated using bootstrap standard errors with 100 replications.

Figure 12 shows how our multidimensional poverty index changes, if we gradually increase the income weight towards unity under the restriction that the remaining three dimensions are equally weighted and that all dimensions sum up to one. It depends on the assumption on the degree of substitutability, if more or less children are deprived in the multidimensional case than in the univariate case with income only. For $\beta = 1$, e.g., low income is perfectly compensated by higher levels in childcare time or parental education and less children are counted as multidimensionally poor than in the univariate case. For $\beta = -1$, low levels in one dimensions are not outweighed by higher levels in the other dimensions and, hence, more children are counted as poor than for income only. If we judge the assumption of less than perfect substitutability as more realistic, then more children face difficult circumstances than if we would only focus on incomes. In 2012, 30 percent of all children experienced multidimensional poverty risk ($\beta = -1$), whereas the share of children living under income poverty risk was 14 percent. In comparison to income

only, many children are additionally counted as poor in the multidimensional setting because of low levels of non-parental childcare time, but also low levels of parental childcare time.

Figure 12: Multidimensional poverty for varying income weights

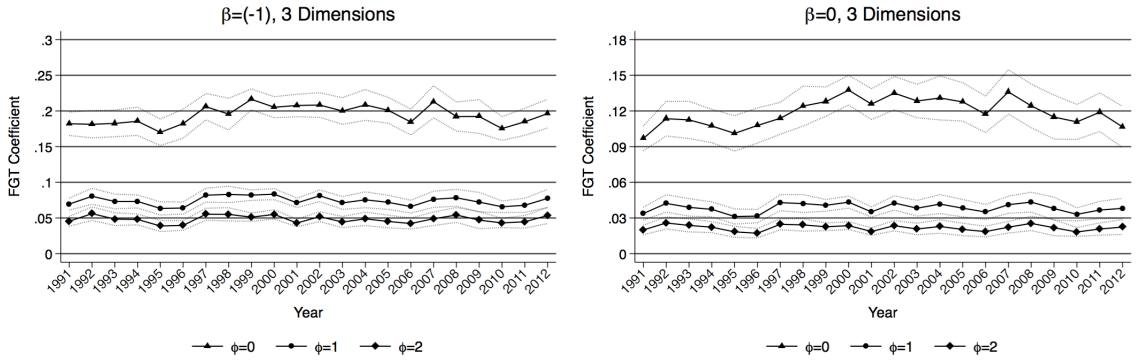


Source: SOEP (v30), own calculations.
Note: Significance at the five percent level is calculated using bootstrap standard errors with 100 replications.

As a robustness check, we compute multidimensional poverty risk using frequency-based weights. As for multidimensional inequality, we broadly find the same trends and similar levels. Multidimensional poverty risk rates based on frequency-based weights tend to be slightly lower for all rates of substitution.[35]

Finally, Figure 13 checks if multidimensional poverty risk is driven by the expansion of non-parental childcare time. As for multidimensional inequality, excluding non-parental childcare takes away the declining trend.

Figure 13: Multidimensional poverty excluding non-parental time



Source: SOEP (v30), own calculations.
Note: Significance at the five percent level is calculated using bootstrap standard errors with 100 replications.

[35]Figures A.3 are in the Appendix.

6 Conclusion

An increasing number of children in Germany are growing up in non-traditional families, particularly in single parent families. These children are often disadvantaged along three dimensions: parental income, parental educational and parental childcare time. Disadvantages may be partly compensated by publicly provided childcare and education. Since the mid-2000s, the German welfare state has heavily expanded publicly provided childcare.

Based on broad empirical evidence, we take parental income, parental education and childcare time as proxies for circumstances that are beyond children's control, but strongly contribute to their later achievements. We apply Maasoumi's index for multidimensional inequality and poverty to measure how the disparity of children's opportunities has evolved since the beginning of the 1990s.

Focusing on income only we find that both inequality and poverty among children increased. However, adding parental education and care time to the picture we find that both multidimensional inequality and poverty among children decreased over time. The expansion of childcare provided by the welfare state more than offsets the disequalizing trends observed for income only. This finding is robust against different parameter values for inequality and poverty aversion as well as the degree of substitutability between dimensions. However, increasing the weight of income and decreasing the weight of publicly provided childcare takes away the declining trend in some constellations. An inequality decomposition by family type reveals that the observed decline in multidimensional inequality is mainly due to reduced differences within family types. In contrast, the effect of changing family patterns on the inequality decline seems negligible. The share of multidimensional poor children decreased for all family types and the gap between them has become smaller over time. More children are counted as poor in the multidimensional setting than if considering income only, because of low levels of non-parental and parental childcare time devoted to them.

In sum, our analysis highlights the importance to consider more than one dimension in inequality and poverty analysis when conclusions about developments over time shall be drawn. Particularly, in-kind benefits such as publicly provided

childcare and education should be accounted for to get a more complete picture of the welfare state's role in redistributing resources and providing less unequal opportunities.

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A Appendix

Table A.1: **Number of observed children (aged 0-14) by family type (unweighted)**

Year	Single Parent	Cohabiting Parents	Married Parents	Total
1991	208	99	2,723	3,030
1992	198	110	2,586	2,894
1993	197	123	2,645	2,965
1994	219	133	2,657	3,009
1995	209	122	2,526	2,857
1996	234	137	2,408	2,779
1997	245	173	2,522	2,940
1998	269	200	2,420	2,889
1999	479	278	4,230	4,987
2000	393	307	3,650	4,350
2001	371	310	3,754	4,435
2002	361	312	3,406	4,079
2003	348	320	3,107	3,775
2004	375	307	2,853	3,535
2005	440	317	2,978	3,735
2006	399	315	2,739	3,453
2007	376	294	2,447	3,117
2008	429	331	2,583	3,343
2009	381	281	2,236	2,898
2010	432	296	2,426	3,154
2011	449	354	2,373	3,176
2012	373	325	2,111	2,809
Total	7,385	5,444	61,380	74,209

Source: SOEP (v30), own calculations.
Note: Children with missing information on at least one of the four dimensions are excluded.

Table A.2: **Descriptive statistics (weighted)**

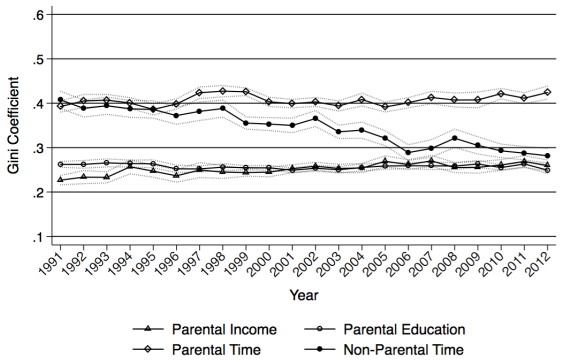
		Parental Income				Parental Education				Parental Time				Non-Parental Time				Total Time			
Year	Family Type	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
	Single	12,144	6,963	1,913	36,590	12	2	7	18	5	5	0	24	4	3	0	12	9	5	0	28
1991	Cohabiting	16,155	5,409	6,321	40,319	13	3	9	18	6	4	0	19	4	3	0	8	10	4	0	23
	Married	18,491	7,610	1,550	70,415	13	3	7	18	6	4	0	30	3	3	0	14	9	4	0	32
	Single	12,565	6,567	721	34,536	12	2	7	18	5	5	0	24	4	3	0	14	9	4	1	24
1992	Cohabiting	16,186	5,021	6,569	36,210	12	3	9	18	5	3	0	24	4	3	0	12	9	4	0	24
	Married	18,890	9,234	4,942	166,946	13	3	7	18	6	5	0	28	4	3	0	12	9	4	0	32
	Single	12,736	7,143	1,012	38,680	11	3	7	18	5	4	0	24	4	3	0	12	9	4	1	24
1993	Cohabiting	16,944	5,987	6,315	37,069	13	2	9	18	7	7	0	48	4	3	0	12	11	7	2	52
	Married	18,994	8,864	3,190	140,065	13	3	7	18	6	5	0	28	3	3	0	12	9	4	0	35
	Single	11,420	7,165	438	46,137	11	2	7	18	6	6	0	24	4	3	0	12	11	6	0	29
1994	Cohabiting	17,050	7,809	4,310	67,208	13	3	9	18	6	5	0	25	4	3	0	12	10	5	0	30
	Married	18,374	9,672	1,418	156,218	13	3	7	18	6	5	0	39	3	3	0	14	10	5	0	39
	Single	11,563	7,007	1,172	42,267	11	2	7	18	6	5	0	24	5	3	0	14	11	5	1	32
1995	Cohabiting	17,553	7,668	3,511	43,797	13	2	9	18	8	6	0	25	3	3	0	12	11	5	0	25
	Married	18,563	8,701	2,437	115,170	13	3	7	18	7	5	0	40	4	3	0	14	10	5	0	40
	Single	13,000	7,113	2,444	43,178	12	2	7	18	5	5	0	24	4	3	0	12	10	5	0	29
1996	Cohabiting	17,635	6,230	4,710	36,106	13	2	9	18	8	6	0	25	3	3	0	12	11	6	0	29
	Married	18,980	8,943	836	118,622	13	3	7	18	7	5	0	48	4	3	0	14	10	5	0	48
	Single	12,816	6,019	2,608	54,962	12	3	7	18	5	5	0	24	5	3	0	14	10	5	0	28
1997	Cohabiting	19,611	21,549	4,814	162,390	13	3	7	18	8	7	0	28	3	3	0	12	11	7	0	36
	Married	19,266	9,792	1,551	132,912	13	3	7	18	6	5	0	34	4	3	0	14	10	5	0	34
	Single	12,886	5,996	3,047	45,522	12	2	7	18	5	5	0	24	5	3	0	14	10	5	0	36
1998	Cohabiting	17,893	8,472	4,392	61,854	13	3	7	18	8	7	0	48	3	3	0	12	11	7	0	48
	Married	19,876	9,651	4,164	102,715	13	3	7	18	7	5	0	32	3	3	0	14	10	5	0	33
	Single	12,772	6,002	3,354	51,097	12	2	7	18	5	4	0	24	5	3	0	14	9	4	0	28
1999	Cohabiting	18,686	7,911	3,788	56,687	13	2	7	18	7	7	0	48	4	3	0	12	11	6	1	52
	Married	20,104	9,230	3,660	144,416	13	3	7	18	6	5	0	36	4	2	0	14	10	5	0	36
	Single	12,331	5,694	2,231	42,240	12	2	7	18	5	4	0	24	4	3	0	14	10	4	0	28
2000	Cohabiting	19,103	8,012	6,266	67,381	13	2	7	18	7	6	0	36	4	3	0	13	11	6	0	41
	Married	20,422	9,487	2,506	94,653	13	3	7	18	6	5	0	30	4	2	0	14	10	5	0	42
	Single	13,109	7,582	352	76,733	11	2	7	18	5	5	0	24	4	3	0	13	10	5	0	29
2001	Cohabiting	18,081	8,857	5,653	100,565	13	2	9	18	7	6	0	27	3	3	0	13	11	6	1	31
	Married	20,823	11,278	2,112	269,016	13	3	7	18	6	5	0	32	4	2	0	13	10	5	0	37

Table A.3: ***Continued*: Descriptive statistics (weighted)**

		Parental Income				Parental Education				Parental Time				Non-Parental Time				Total Time			
Year	Family Type	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
	Single	12,082	6,286	1,727	62,231	11	2	7	18	6	5	0	24	4	3	0	13	11	5	1	32
2002	Cohabiting	18,289	9,478	4,938	104,115	13	3	9	18	8	6	0	45	3	3	0	13	11	6	0	45
	Married	21,147	10,292	4,262	131,635	13	3	7	18	7	5	0	36	4	3	0	15	11	5	0	41
	Single	12,177	5,918	1,004	61,793	11	2	7	18	6	5	0	24	5	3	0	13	11	5	0	36
2003	Cohabiting	17,992	9,587	4,742	83,652	12	2	7	18	7	6	0	29	4	3	0	14	11	6	0	34
	Married	21,035	10,029	3,715	207,782	13	3	7	18	7	5	0	48	4	2	0	13	10	5	0	60
	Single	11,927	5,428	2,538	77,639	12	2	7	18	7	6	0	24	4	3	0	13	11	5	1	28
2004	Cohabiting	18,183	9,182	3,515	111,304	13	3	9	18	9	7	0	31	4	3	0	13	13	7	0	39
	Married	21,321	9,991	1,269	166,880	13	3	7	18	7	5	0	48	4	2	0	13	11	5	0	54
	Single	12,491	5,812	2,498	111,617	12	3	7	18	6	5	0	24	5	3	0	14	11	5	1	38
2005	Cohabiting	17,172	8,907	2,217	59,178	13	2	9	18	8	6	0	30	4	3	0	13	12	6	0	31
	Married	21,490	11,785	2,187	158,590	13	3	7	18	7	5	0	48	4	2	0	14	11	5	0	48
	Single	12,591	5,418	2,521	92,204	12	3	7	18	6	5	0	24	5	3	0	14	11	6	1	38
2006	Cohabiting	19,452	9,406	3,726	67,915	13	3	7	18	8	6	0	36	4	3	0	12	12	6	0	42
	Married	21,689	11,574	3,902	182,342	13	3	7	18	7	5	0	48	4	2	0	14	11	5	0	52
	Single	12,839	5,258	2,208	56,365	12	3	7	18	6	5	0	24	5	3	0	14	11	5	0	30
2007	Cohabiting	19,998	13,250	3,108	70,051	13	3	9	18	8	7	0	40	4	3	0	14	12	6	0	40
	Married	21,875	11,451	4,496	129,508	13	3	7	18	7	5	0	36	4	2	0	14	11	5	0	42
	Single	13,110	5,881	1,616	65,233	12	3	7	18	6	4	0	24	5	2	0	13	11	5	0	28
2008	Cohabiting	19,683	9,905	4,318	50,624	13	3	7	18	9	7	0	48	4	3	0	12	13	7	0	48
	Married	21,520	10,125	4,056	107,732	13	3	7	18	7	5	0	36	4	2	0	12	11	5	0	40
	Single	13,663	5,919	1,493	42,507	12	3	7	18	6	5	0	24	5	2	0	14	11	5	0	32
2009	Cohabiting	20,391	12,578	907	65,367	13	3	7	18	8	7	0	48	5	3	0	12	12	6	2	48
	Married	21,779	9,964	3,891	128,101	13	3	7	18	6	5	0	34	5	3	0	12	11	5	0	42
	Single	13,345	5,999	2,233	53,494	12	3	7	18	6	5	0	24	6	2	0	14	11	5	0	32
2010	Cohabiting	19,972	8,147	2,744	57,932	13	3	7	18	9	8	0	48	5	3	0	12	14	7	1	52
	Married	22,210	11,097	3,490	132,710	14	3	7	18	7	5	0	48	5	3	0	13	11	5	0	52
	Single	14,075	7,913	3,696	99,350	12	3	7	18	5	5	0	24	6	3	0	15	11	5	0	33
2011	Cohabiting	19,285	8,238	1,798	146,790	13	2	7	18	6	5	0	48	5	3	0	14	11	5	0	48
	Married	21,833	11,952	2,880	137,571	13	3	7	18	6	5	0	34	5	2	0	14	11	5	0	42
	Single	14,279	7,178	2,357	55,967	12	3	7	18	6	6	0	24	6	2	0	13	12	6	0	30
2012	Cohabiting	19,517	9,475	1,757	106,335	13	2	7	18	7	6	0	48	5	3	0	13	12	5	0	48
	Married	22,707	11,461	2,850	129,842	14	3	7	18	6	5	0	48	5	2	0	12	11	5	0	48

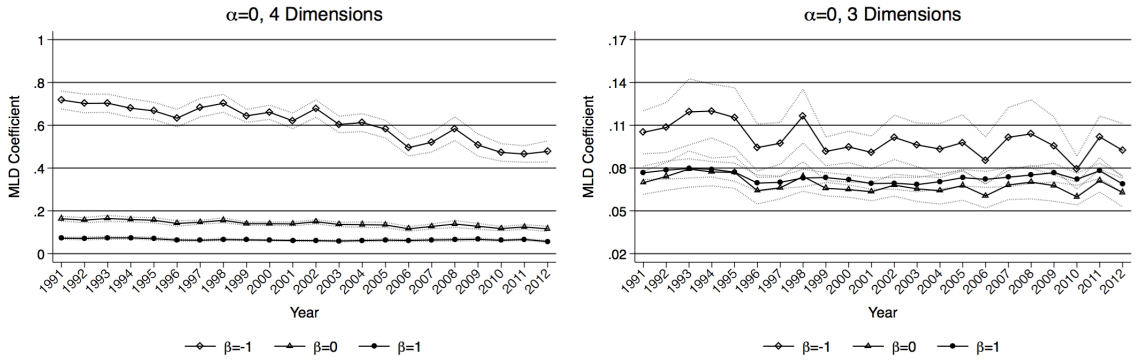
Source: SOEP (v30), own calculations.

Figure A.1: Inequality by dimension (Gini coefficient)



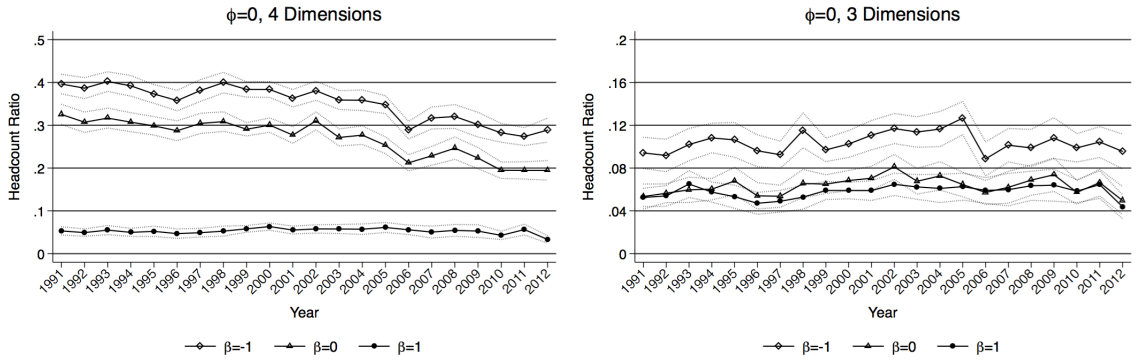
Source: SOEP (v30), own calculations.
Note: Parental time is equivalized according to the number of children in the family. Significance at the five percent level is calculated using bootstrap standard errors with 100 replications.

Figure A.2: Multidimensional inequality (with frequency-based weights)



Source: SOEP (v30), own calculations.
Note: Significance at the five percent level is calculated using bootstrap standard errors with 100 replications. Frequency-based weights, 4 dimensions: $w_{inc} = .2835$, $w_{educ} = .3492$, $w_{time} = .1699$, and $w_{np-time} = .1974$. Frequency-based weights, 3 dimensions: $w_{inc} = .3091$, $w_{educ} = .3819$, and $w_{total-time} = .3090$.

Figure A.3: Multidimensional poverty (with frequency-based weights)



Source: SOEP (v30), own calculations.
Note: Significance at the five percent level is calculated using bootstrap standard errors with 100 replications. Frequency-based weights, 4 dimensions: $w_{inc} = .2835$, $w_{educ} = .3492$, $w_{time} = .1699$, and $w_{np-time} = .1974$. Frequency-based weights, 3 dimensions: $w_{inc} = .3091$, $w_{educ} = .3819$, and $w_{total-time} = .3090$.

Table A.4: **Multidimensional inequality** (weighting scheme: $w_{inc} = \frac{1}{4}$, $w_{educ} = \frac{1}{4}$, $w_{time} = \frac{1}{4}$, and $w_{np-time} = \frac{1}{4}$)

	$\alpha = 0$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.775	0.730	0.820	0.205	0.193	0.217	0.062	0.058	0.066
1992	0.759	0.712	0.806	0.197	0.184	0.209	0.061	0.056	0.066
1993	0.755	0.710	0.800	0.200	0.185	0.214	0.063	0.058	0.069
1994	0.732	0.685	0.778	0.194	0.182	0.206	0.063	0.058	0.068
1995	0.716	0.673	0.760	0.190	0.177	0.202	0.059	0.054	0.065
1996	0.684	0.640	0.728	0.176	0.163	0.189	0.054	0.049	0.060
1997	0.739	0.693	0.786	0.186	0.177	0.196	0.054	0.051	0.057
1998	0.759	0.714	0.804	0.196	0.184	0.208	0.057	0.053	0.062
1999	0.698	0.666	0.731	0.178	0.169	0.188	0.055	0.052	0.059
2000	0.716	0.680	0.752	0.180	0.171	0.190	0.053	0.050	0.056
2001	0.671	0.632	0.711	0.177	0.166	0.187	0.053	0.049	0.057
2002	0.733	0.689	0.777	0.189	0.178	0.199	0.052	0.049	0.055
2003	0.650	0.609	0.692	0.172	0.161	0.183	0.051	0.047	0.055
2004	0.663	0.618	0.708	0.171	0.158	0.185	0.052	0.048	0.056
2005	0.627	0.582	0.671	0.166	0.154	0.179	0.052	0.048	0.057
2006	0.534	0.493	0.576	0.143	0.131	0.155	0.050	0.046	0.055
2007	0.560	0.511	0.609	0.156	0.142	0.169	0.053	0.048	0.058
2008	0.629	0.570	0.689	0.171	0.154	0.189	0.055	0.049	0.060
2009	0.546	0.490	0.601	0.155	0.139	0.170	0.056	0.050	0.061
2010	0.511	0.467	0.555	0.143	0.131	0.155	0.052	0.048	0.056
2011	0.498	0.456	0.539	0.146	0.134	0.159	0.055	0.050	0.060
2012	0.515	0.463	0.566	0.141	0.127	0.155	0.047	0.043	0.050
	$\alpha = 1$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.383	0.355	0.411	0.160	0.150	0.170	0.058	0.055	0.061
1992	0.371	0.344	0.399	0.153	0.143	0.163	0.056	0.052	0.060
1993	0.372	0.346	0.398	0.156	0.145	0.167	0.059	0.054	0.063
1994	0.361	0.334	0.388	0.152	0.142	0.162	0.059	0.055	0.063
1995	0.346	0.322	0.370	0.149	0.140	0.158	0.056	0.052	0.061
1996	0.329	0.305	0.352	0.139	0.129	0.149	0.052	0.048	0.057
1997	0.367	0.340	0.395	0.150	0.141	0.159	0.052	0.049	0.055
1998	0.373	0.347	0.400	0.155	0.145	0.164	0.054	0.050	0.057
1999	0.343	0.325	0.361	0.141	0.134	0.148	0.052	0.050	0.055
2000	0.345	0.325	0.365	0.142	0.135	0.150	0.050	0.048	0.053
2001	0.319	0.299	0.340	0.138	0.130	0.146	0.050	0.047	0.053
2002	0.350	0.325	0.374	0.148	0.140	0.157	0.049	0.047	0.052
2003	0.306	0.284	0.327	0.134	0.125	0.142	0.048	0.045	0.052
2004	0.312	0.288	0.335	0.134	0.124	0.144	0.049	0.045	0.052
2005	0.295	0.273	0.317	0.129	0.120	0.138	0.049	0.046	0.053
2006	0.247	0.227	0.267	0.111	0.103	0.120	0.047	0.044	0.051
2007	0.263	0.239	0.286	0.119	0.110	0.128	0.049	0.045	0.053
2008	0.291	0.262	0.321	0.132	0.119	0.144	0.051	0.047	0.055
2009	0.250	0.224	0.277	0.117	0.106	0.128	0.052	0.047	0.056
2010	0.235	0.215	0.255	0.110	0.101	0.118	0.049	0.046	0.052
2011	0.230	0.211	0.249	0.110	0.101	0.118	0.051	0.047	0.054
2012	0.240	0.215	0.264	0.109	0.098	0.119	0.044	0.041	0.048
	$\alpha = 2$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.303	0.277	0.330	0.145	0.135	0.155	0.058	0.055	0.061
1992	0.290	0.265	0.316	0.138	0.129	0.148	0.056	0.053	0.059
1993	0.296	0.271	0.320	0.142	0.131	0.153	0.059	0.055	0.062
1994	0.287	0.261	0.312	0.138	0.128	0.148	0.059	0.056	0.063
1995	0.273	0.251	0.294	0.136	0.126	0.145	0.057	0.052	0.062
1996	0.256	0.235	0.278	0.127	0.117	0.137	0.053	0.048	0.058
1997	0.295	0.269	0.321	0.138	0.128	0.148	0.053	0.050	0.056
1998	0.301	0.274	0.328	0.141	0.132	0.151	0.053	0.050	0.057
1999	0.275	0.258	0.291	0.129	0.122	0.136	0.052	0.050	0.054
2000	0.271	0.252	0.289	0.129	0.122	0.136	0.050	0.048	0.052
2001	0.247	0.230	0.265	0.123	0.116	0.131	0.050	0.047	0.053
2002	0.274	0.252	0.296	0.135	0.126	0.144	0.050	0.047	0.052
2003	0.236	0.217	0.254	0.120	0.112	0.128	0.049	0.045	0.052
2004	0.240	0.219	0.261	0.120	0.111	0.130	0.049	0.045	0.052
2005	0.229	0.209	0.248	0.116	0.108	0.124	0.049	0.046	0.052
2006	0.189	0.172	0.205	0.099	0.092	0.107	0.048	0.044	0.051
2007	0.205	0.185	0.225	0.106	0.098	0.115	0.049	0.045	0.052
2008	0.224	0.199	0.249	0.117	0.106	0.129	0.050	0.046	0.054
2009	0.188	0.167	0.209	0.102	0.092	0.112	0.051	0.047	0.055
2010	0.178	0.162	0.194	0.097	0.089	0.104	0.048	0.045	0.051
2011	0.175	0.160	0.190	0.096	0.088	0.103	0.050	0.046	0.053
2012	0.183	0.163	0.203	0.096	0.087	0.106	0.044	0.041	0.047

Source: SOEP (v30), own calculations.

Table A.5: **Multidimensional inequality** (weighting scheme: $w_{inc} = \frac{1}{2}$, $w_{educ} = \frac{1}{6}$, $w_{time} = \frac{1}{6}$, and $w_{np-time} = \frac{1}{6}$)

	$\alpha = 0$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.585	0.552	0.618	0.126	0.117	0.135	0.055	0.052	0.059
1992	0.573	0.539	0.607	0.121	0.113	0.129	0.055	0.050	0.059
1993	0.574	0.540	0.608	0.125	0.115	0.134	0.056	0.052	0.061
1994	0.556	0.523	0.590	0.126	0.118	0.134	0.058	0.054	0.062
1995	0.547	0.515	0.579	0.124	0.115	0.133	0.055	0.050	0.060
1996	0.521	0.489	0.552	0.113	0.103	0.122	0.050	0.046	0.055
1997	0.562	0.527	0.596	0.119	0.112	0.127	0.051	0.048	0.054
1998	0.576	0.543	0.610	0.123	0.115	0.132	0.053	0.049	0.057
1999	0.533	0.508	0.557	0.115	0.109	0.121	0.052	0.049	0.055
2000	0.548	0.521	0.575	0.115	0.109	0.122	0.050	0.048	0.053
2001	0.517	0.488	0.545	0.117	0.110	0.123	0.051	0.048	0.054
2002	0.567	0.535	0.600	0.128	0.120	0.136	0.050	0.048	0.053
2003	0.506	0.476	0.536	0.117	0.109	0.125	0.049	0.045	0.052
2004	0.513	0.479	0.547	0.114	0.105	0.123	0.049	0.046	0.053
2005	0.490	0.457	0.523	0.116	0.108	0.125	0.051	0.047	0.055
2006	0.422	0.390	0.454	0.101	0.093	0.109	0.049	0.045	0.052
2007	0.443	0.406	0.480	0.111	0.102	0.120	0.051	0.047	0.056
2008	0.492	0.448	0.536	0.117	0.105	0.129	0.052	0.047	0.057
2009	0.429	0.388	0.471	0.108	0.098	0.118	0.053	0.048	0.058
2010	0.404	0.371	0.437	0.104	0.096	0.111	0.050	0.047	0.054
2011	0.397	0.366	0.428	0.107	0.099	0.116	0.054	0.049	0.058
2012	0.406	0.367	0.444	0.099	0.091	0.107	0.045	0.042	0.049
	$\alpha = 1$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.340	0.316	0.363	0.108	0.101	0.116	0.052	0.049	0.055
1992	0.330	0.306	0.353	0.104	0.098	0.111	0.052	0.048	0.055
1993	0.332	0.309	0.356	0.109	0.101	0.117	0.054	0.050	0.058
1994	0.326	0.303	0.349	0.110	0.103	0.116	0.055	0.052	0.059
1995	0.317	0.295	0.339	0.109	0.101	0.117	0.053	0.049	0.057
1996	0.299	0.278	0.319	0.100	0.091	0.109	0.049	0.045	0.053
1997	0.331	0.306	0.356	0.109	0.101	0.116	0.050	0.047	0.053
1998	0.335	0.311	0.359	0.110	0.102	0.117	0.051	0.047	0.054
1999	0.308	0.292	0.324	0.102	0.096	0.107	0.050	0.047	0.052
2000	0.313	0.295	0.331	0.102	0.096	0.107	0.048	0.046	0.050
2001	0.292	0.274	0.309	0.103	0.097	0.108	0.049	0.047	0.052
2002	0.322	0.301	0.344	0.112	0.105	0.118	0.049	0.046	0.052
2003	0.284	0.266	0.302	0.102	0.096	0.108	0.047	0.044	0.050
2004	0.288	0.267	0.309	0.100	0.093	0.107	0.047	0.044	0.051
2005	0.278	0.258	0.298	0.103	0.096	0.110	0.049	0.046	0.053
2006	0.236	0.218	0.255	0.090	0.083	0.097	0.047	0.044	0.050
2007	0.250	0.228	0.271	0.097	0.090	0.105	0.049	0.045	0.053
2008	0.274	0.248	0.299	0.102	0.092	0.111	0.049	0.045	0.054
2009	0.236	0.213	0.259	0.093	0.085	0.101	0.050	0.046	0.054
2010	0.222	0.204	0.240	0.090	0.083	0.096	0.048	0.045	0.051
2011	0.222	0.205	0.238	0.093	0.086	0.100	0.051	0.047	0.054
2012	0.226	0.204	0.247	0.088	0.080	0.095	0.044	0.041	0.047
	$\alpha = 2$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.284	0.260	0.308	0.105	0.097	0.112	0.053	0.050	0.055
1992	0.271	0.248	0.294	0.100	0.094	0.106	0.052	0.049	0.056
1993	0.279	0.254	0.304	0.106	0.097	0.116	0.055	0.051	0.059
1994	0.275	0.251	0.299	0.107	0.100	0.114	0.057	0.052	0.061
1995	0.270	0.245	0.295	0.107	0.097	0.117	0.054	0.049	0.058
1996	0.252	0.230	0.274	0.100	0.089	0.110	0.051	0.046	0.055
1997	0.287	0.259	0.316	0.110	0.100	0.121	0.052	0.049	0.055
1998	0.287	0.258	0.317	0.109	0.099	0.119	0.051	0.047	0.055
1999	0.261	0.244	0.278	0.101	0.095	0.107	0.050	0.048	0.052
2000	0.260	0.242	0.279	0.099	0.093	0.105	0.048	0.046	0.051
2001	0.242	0.226	0.258	0.101	0.096	0.107	0.050	0.048	0.053
2002	0.271	0.250	0.292	0.110	0.103	0.117	0.050	0.047	0.053
2003	0.235	0.218	0.252	0.100	0.094	0.106	0.048	0.045	0.051
2004	0.238	0.219	0.257	0.098	0.090	0.105	0.048	0.044	0.051
2005	0.235	0.214	0.256	0.102	0.094	0.111	0.050	0.046	0.053
2006	0.199	0.181	0.217	0.089	0.082	0.097	0.048	0.045	0.051
2007	0.213	0.192	0.234	0.096	0.088	0.105	0.049	0.046	0.053
2008	0.228	0.203	0.252	0.099	0.090	0.109	0.049	0.045	0.053
2009	0.192	0.172	0.212	0.089	0.081	0.097	0.050	0.046	0.054
2010	0.181	0.166	0.196	0.087	0.080	0.093	0.048	0.045	0.051
2011	0.185	0.170	0.200	0.092	0.084	0.099	0.051	0.047	0.054
2012	0.187	0.167	0.206	0.086	0.078	0.095	0.045	0.042	0.048

Source: SOEP (v30), own calculations.

Table A.6: **Multidimensional inequality** (weighting scheme: $w_{inc} = \frac{3}{4}$, $w_{educ} = \frac{1}{12}$, $w_{time} = \frac{1}{12}$, and $w_{np-time} = \frac{1}{12}$)

	$\alpha = 0$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.585	0.354	0.394	0.085	0.076	0.093	0.050	0.047	0.054
1992	0.573	0.348	0.388	0.085	0.078	0.092	0.052	0.047	0.057
1993	0.574	0.351	0.394	0.087	0.079	0.095	0.053	0.048	0.058
1994	0.556	0.344	0.385	0.099	0.089	0.108	0.057	0.052	0.063
1995	0.547	0.340	0.382	0.095	0.085	0.105	0.054	0.049	0.059
1996	0.521	0.322	0.362	0.084	0.075	0.094	0.050	0.045	0.055
1997	0.562	0.347	0.392	0.090	0.081	0.099	0.053	0.048	0.058
1998	0.576	0.355	0.397	0.089	0.081	0.097	0.052	0.047	0.057
1999	0.533	0.336	0.368	0.087	0.082	0.091	0.053	0.050	0.056
2000	0.548	0.345	0.379	0.088	0.081	0.095	0.052	0.049	0.056
2001	0.517	0.332	0.365	0.092	0.087	0.097	0.055	0.052	0.058
2002	0.567	0.364	0.403	0.102	0.095	0.109	0.055	0.052	0.059
2003	0.506	0.328	0.365	0.095	0.087	0.103	0.052	0.049	0.056
2004	0.513	0.327	0.369	0.092	0.085	0.099	0.052	0.049	0.056
2005	0.490	0.320	0.362	0.100	0.092	0.108	0.057	0.053	0.062
2006	0.422	0.279	0.321	0.090	0.083	0.097	0.053	0.049	0.057
2007	0.443	0.291	0.338	0.098	0.089	0.106	0.057	0.052	0.062
2008	0.492	0.312	0.367	0.094	0.085	0.103	0.054	0.050	0.059
2009	0.429	0.278	0.328	0.091	0.082	0.100	0.056	0.050	0.061
2010	0.404	0.268	0.310	0.092	0.085	0.099	0.054	0.050	0.058
2011	0.397	0.269	0.308	0.097	0.088	0.105	0.058	0.053	0.063
2012	0.406	0.266	0.313	0.087	0.080	0.094	0.050	0.046	0.054
	$\alpha = 1$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.272	0.255	0.289	0.079	0.072	0.086	0.049	0.046	0.052
1992	0.266	0.249	0.283	0.081	0.074	0.087	0.052	0.046	0.057
1993	0.271	0.252	0.290	0.084	0.076	0.093	0.053	0.048	0.059
1994	0.268	0.251	0.285	0.093	0.085	0.102	0.057	0.051	0.064
1995	0.266	0.246	0.287	0.091	0.080	0.102	0.054	0.049	0.059
1996	0.251	0.232	0.269	0.083	0.071	0.095	0.050	0.045	0.056
1997	0.278	0.255	0.302	0.093	0.081	0.106	0.055	0.049	0.062
1998	0.276	0.256	0.296	0.089	0.079	0.099	0.053	0.047	0.058
1999	0.256	0.243	0.270	0.084	0.079	0.090	0.052	0.050	0.055
2000	0.261	0.247	0.276	0.084	0.078	0.090	0.052	0.048	0.055
2001	0.251	0.238	0.264	0.092	0.086	0.097	0.056	0.053	0.059
2002	0.277	0.261	0.293	0.098	0.092	0.104	0.055	0.052	0.059
2003	0.248	0.234	0.262	0.091	0.085	0.098	0.053	0.049	0.056
2004	0.249	0.233	0.266	0.089	0.082	0.096	0.052	0.048	0.056
2005	0.249	0.232	0.267	0.100	0.091	0.109	0.058	0.053	0.063
2006	0.218	0.201	0.234	0.091	0.083	0.099	0.054	0.050	0.058
2007	0.229	0.210	0.248	0.097	0.088	0.106	0.057	0.052	0.062
2008	0.242	0.221	0.262	0.092	0.083	0.101	0.054	0.049	0.058
2009	0.214	0.196	0.232	0.088	0.079	0.097	0.054	0.049	0.059
2010	0.204	0.189	0.220	0.089	0.082	0.097	0.053	0.049	0.057
2011	0.209	0.194	0.224	0.097	0.087	0.106	0.058	0.053	0.063
2012	0.207	0.190	0.225	0.087	0.079	0.096	0.051	0.046	0.055
	$\alpha = 2$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.252	0.232	0.272	0.082	0.074	0.090	0.051	0.047	0.054
1992	0.243	0.224	0.263	0.085	0.077	0.094	0.055	0.047	0.063
1993	0.253	0.229	0.278	0.091	0.079	0.102	0.057	0.049	0.065
1994	0.253	0.231	0.274	0.100	0.088	0.112	0.062	0.052	0.072
1995	0.259	0.224	0.293	0.099	0.081	0.116	0.057	0.050	0.064
1996	0.244	0.212	0.276	0.092	0.073	0.112	0.054	0.046	0.062
1997	0.280	0.240	0.320	0.111	0.088	0.134	0.062	0.052	0.072
1998	0.266	0.233	0.299	0.099	0.083	0.115	0.056	0.049	0.064
1999	0.242	0.225	0.259	0.091	0.084	0.098	0.055	0.052	0.058
2000	0.244	0.226	0.262	0.089	0.082	0.097	0.054	0.050	0.057
2001	0.240	0.224	0.255	0.106	0.097	0.114	0.062	0.058	0.067
2002	0.265	0.246	0.284	0.107	0.099	0.114	0.059	0.055	0.063
2003	0.233	0.217	0.249	0.100	0.093	0.107	0.056	0.053	0.060
2004	0.234	0.215	0.252	0.097	0.087	0.106	0.055	0.050	0.059
2005	0.244	0.220	0.268	0.114	0.099	0.128	0.063	0.056	0.070
2006	0.213	0.193	0.233	0.104	0.093	0.115	0.059	0.054	0.064
2007	0.225	0.201	0.250	0.109	0.096	0.123	0.061	0.055	0.068
2008	0.229	0.206	0.251	0.099	0.088	0.110	0.056	0.050	0.061
2009	0.199	0.179	0.219	0.094	0.082	0.106	0.056	0.050	0.062
2010	0.191	0.174	0.208	0.097	0.086	0.107	0.056	0.051	0.061
2011	0.204	0.184	0.223	0.109	0.095	0.123	0.062	0.055	0.069
2012	0.197	0.176	0.218	0.097	0.085	0.109	0.055	0.049	0.060

Source: SOEP (v30), own calculations.

Table A.7: **Multidimensional inequality** (weighting scheme: $w_{inc} = \frac{9}{10}$, $w_{educ} = \frac{1}{30}$, $w_{time} = \frac{1}{30}$, and $w_{np-time} = \frac{1}{30}$)

	$\alpha = 0$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.202	0.190	0.214	0.082	0.073	0.091	0.058	0.053	0.062
1992	0.200	0.190	0.211	0.086	0.076	0.095	0.062	0.054	0.069
1993	0.206	0.192	0.219	0.086	0.076	0.095	0.062	0.055	0.069
1994	0.210	0.197	0.224	0.105	0.092	0.118	0.071	0.062	0.080
1995	0.209	0.193	0.225	0.097	0.085	0.109	0.067	0.059	0.074
1996	0.195	0.179	0.210	0.087	0.076	0.098	0.061	0.054	0.069
1997	0.212	0.195	0.229	0.094	0.081	0.106	0.068	0.059	0.077
1998	0.212	0.197	0.226	0.091	0.080	0.101	0.065	0.057	0.072
1999	0.201	0.192	0.211	0.089	0.084	0.095	0.066	0.062	0.070
2000	0.207	0.196	0.218	0.092	0.084	0.101	0.067	0.061	0.072
2001	0.208	0.199	0.217	0.098	0.092	0.104	0.071	0.067	0.076
2002	0.230	0.219	0.241	0.106	0.099	0.114	0.074	0.069	0.079
2003	0.211	0.200	0.223	0.101	0.092	0.110	0.070	0.064	0.075
2004	0.209	0.197	0.221	0.098	0.091	0.106	0.068	0.063	0.074
2005	0.215	0.201	0.228	0.110	0.100	0.120	0.077	0.070	0.084
2006	0.195	0.182	0.208	0.101	0.093	0.109	0.071	0.066	0.077
2007	0.204	0.190	0.219	0.107	0.098	0.117	0.076	0.069	0.083
2008	0.209	0.193	0.225	0.098	0.089	0.107	0.069	0.063	0.075
2009	0.194	0.180	0.209	0.098	0.088	0.107	0.070	0.063	0.078
2010	0.191	0.178	0.204	0.101	0.092	0.110	0.070	0.065	0.076
2011	0.195	0.181	0.208	0.106	0.096	0.117	0.076	0.068	0.083
2012	0.190	0.176	0.203	0.098	0.089	0.106	0.068	0.062	0.075
	$\alpha = 1$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.181	0.170	0.192	0.079	0.071	0.087	0.058	0.053	0.063
1992	0.179	0.168	0.190	0.086	0.074	0.098	0.065	0.054	0.075
1993	0.185	0.171	0.199	0.086	0.075	0.097	0.065	0.055	0.074
1994	0.189	0.177	0.201	0.102	0.088	0.117	0.074	0.061	0.087
1995	0.192	0.172	0.211	0.095	0.082	0.109	0.068	0.059	0.077
1996	0.180	0.160	0.199	0.088	0.074	0.103	0.064	0.054	0.075
1997	0.204	0.181	0.228	0.103	0.084	0.122	0.075	0.061	0.089
1998	0.195	0.178	0.212	0.094	0.081	0.107	0.068	0.058	0.078
1999	0.183	0.173	0.194	0.090	0.084	0.096	0.067	0.063	0.072
2000	0.186	0.175	0.198	0.091	0.083	0.099	0.068	0.062	0.073
2001	0.191	0.182	0.200	0.103	0.095	0.110	0.077	0.071	0.082
2002	0.207	0.196	0.218	0.105	0.098	0.112	0.075	0.070	0.080
2003	0.190	0.180	0.199	0.100	0.092	0.107	0.072	0.067	0.076
2004	0.188	0.176	0.201	0.098	0.089	0.107	0.070	0.064	0.076
2005	0.200	0.183	0.216	0.114	0.101	0.126	0.082	0.073	0.090
2006	0.180	0.166	0.194	0.106	0.096	0.116	0.076	0.069	0.083
2007	0.188	0.172	0.205	0.112	0.100	0.123	0.080	0.071	0.089
2008	0.187	0.172	0.202	0.099	0.089	0.108	0.070	0.064	0.077
2009	0.173	0.159	0.188	0.097	0.086	0.108	0.071	0.063	0.079
2010	0.170	0.157	0.184	0.102	0.091	0.112	0.072	0.065	0.080
2011	0.179	0.164	0.194	0.111	0.098	0.124	0.080	0.071	0.089
2012	0.172	0.157	0.187	0.101	0.090	0.112	0.072	0.064	0.080
	$\alpha = 2$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.188	0.173	0.203	0.085	0.075	0.094	0.062	0.056	0.069
1992	0.187	0.171	0.202	0.101	0.080	0.122	0.077	0.057	0.097
1993	0.197	0.175	0.218	0.100	0.079	0.120	0.075	0.057	0.093
1994	0.203	0.184	0.222	0.121	0.092	0.150	0.089	0.063	0.115
1995	0.214	0.173	0.255	0.109	0.084	0.134	0.076	0.061	0.092
1996	0.203	0.162	0.244	0.105	0.077	0.132	0.074	0.057	0.092
1997	0.246	0.194	0.298	0.135	0.096	0.175	0.095	0.068	0.122
1998	0.216	0.183	0.249	0.111	0.088	0.134	0.079	0.064	0.095
1999	0.197	0.182	0.213	0.101	0.092	0.110	0.074	0.068	0.080
2000	0.200	0.183	0.217	0.101	0.090	0.112	0.075	0.067	0.082
2001	0.217	0.201	0.234	0.131	0.115	0.146	0.096	0.084	0.107
2002	0.228	0.213	0.243	0.120	0.111	0.129	0.085	0.079	0.091
2003	0.206	0.193	0.219	0.115	0.106	0.124	0.082	0.076	0.088
2004	0.204	0.185	0.222	0.112	0.098	0.125	0.079	0.070	0.088
2005	0.231	0.201	0.261	0.140	0.117	0.163	0.098	0.083	0.114
2006	0.206	0.184	0.229	0.130	0.113	0.147	0.091	0.080	0.102
2007	0.215	0.186	0.244	0.134	0.114	0.154	0.094	0.081	0.107
2008	0.202	0.182	0.222	0.112	0.099	0.124	0.078	0.069	0.086
2009	0.186	0.164	0.207	0.110	0.094	0.126	0.078	0.067	0.088
2010	0.184	0.163	0.204	0.117	0.101	0.133	0.081	0.071	0.092
2011	0.205	0.179	0.230	0.135	0.114	0.156	0.094	0.080	0.109
2012	0.190	0.166	0.213	0.119	0.102	0.136	0.083	0.071	0.094

Source: SOEP (v30), own calculations.

Table A.8: **Multidimensional inequality** (weighting scheme: $w_{inc} = \frac{1}{3}$, $w_{educ} = \frac{1}{3}$, $w_{time} = \frac{1}{3}$, and $w_{np-time} = 0$)

	$\alpha = 0$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.166	0.147	0.184	0.096	0.087	0.105	0.082	0.077	0.088
1992	0.197	0.171	0.223	0.109	0.098	0.120	0.086	0.080	0.093
1993	0.179	0.153	0.204	0.105	0.093	0.117	0.086	0.080	0.093
1994	0.177	0.156	0.199	0.102	0.092	0.111	0.085	0.079	0.090
1995	0.155	0.133	0.177	0.096	0.086	0.106	0.084	0.077	0.090
1996	0.154	0.135	0.173	0.090	0.081	0.098	0.076	0.070	0.082
1997	0.202	0.178	0.225	0.108	0.098	0.117	0.079	0.074	0.084
1998	0.201	0.176	0.226	0.108	0.096	0.119	0.081	0.074	0.089
1999	0.191	0.175	0.206	0.107	0.100	0.115	0.084	0.079	0.088
2000	0.197	0.179	0.216	0.105	0.099	0.112	0.081	0.077	0.085
2001	0.163	0.149	0.178	0.095	0.089	0.102	0.078	0.073	0.082
2002	0.188	0.168	0.207	0.106	0.097	0.115	0.080	0.074	0.086
2003	0.165	0.143	0.186	0.097	0.087	0.107	0.078	0.072	0.085
2004	0.182	0.156	0.208	0.102	0.091	0.114	0.080	0.074	0.087
2005	0.177	0.152	0.203	0.102	0.091	0.113	0.082	0.076	0.089
2006	0.165	0.143	0.186	0.095	0.085	0.104	0.081	0.075	0.087
2007	0.188	0.162	0.215	0.105	0.094	0.116	0.082	0.075	0.089
2008	0.200	0.171	0.230	0.110	0.098	0.123	0.084	0.078	0.090
2009	0.178	0.144	0.211	0.101	0.086	0.115	0.085	0.077	0.092
2010	0.171	0.153	0.190	0.098	0.090	0.107	0.082	0.077	0.088
2011	0.176	0.151	0.200	0.102	0.092	0.112	0.089	0.083	0.096
2012	0.199	0.168	0.230	0.103	0.090	0.117	0.081	0.072	0.090
	$\alpha = 1$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.105	0.096	0.113	0.078	0.072	0.084	0.078	0.074	0.082
1992	0.116	0.105	0.127	0.087	0.080	0.094	0.081	0.076	0.085
1993	0.113	0.102	0.125	0.086	0.078	0.094	0.082	0.076	0.087
1994	0.115	0.104	0.125	0.082	0.076	0.089	0.079	0.075	0.083
1995	0.104	0.094	0.115	0.080	0.073	0.087	0.078	0.073	0.083
1996	0.103	0.093	0.112	0.076	0.070	0.082	0.072	0.067	0.076
1997	0.125	0.115	0.135	0.089	0.082	0.096	0.074	0.070	0.078
1998	0.126	0.113	0.139	0.088	0.081	0.096	0.075	0.070	0.081
1999	0.124	0.116	0.131	0.089	0.084	0.094	0.077	0.074	0.081
2000	0.121	0.113	0.129	0.086	0.082	0.091	0.074	0.071	0.078
2001	0.107	0.101	0.113	0.080	0.076	0.084	0.073	0.070	0.076
2002	0.117	0.109	0.125	0.086	0.081	0.091	0.074	0.070	0.077
2003	0.105	0.097	0.113	0.079	0.073	0.084	0.072	0.068	0.076
2004	0.114	0.103	0.124	0.084	0.077	0.091	0.075	0.070	0.080
2005	0.115	0.103	0.126	0.086	0.078	0.093	0.077	0.072	0.082
2006	0.106	0.097	0.115	0.080	0.074	0.086	0.076	0.071	0.080
2007	0.122	0.109	0.135	0.088	0.080	0.096	0.076	0.071	0.082
2008	0.119	0.107	0.131	0.089	0.081	0.098	0.078	0.073	0.082
2009	0.110	0.096	0.124	0.083	0.073	0.093	0.078	0.072	0.084
2010	0.108	0.100	0.116	0.082	0.076	0.088	0.076	0.072	0.080
2011	0.111	0.101	0.121	0.085	0.078	0.091	0.081	0.076	0.086
2012	0.120	0.107	0.133	0.084	0.076	0.092	0.072	0.067	0.078
	$\alpha = 2$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.095	0.086	0.104	0.076	0.070	0.081	0.080	0.076	0.084
1992	0.102	0.093	0.111	0.083	0.077	0.090	0.083	0.079	0.088
1993	0.105	0.093	0.116	0.084	0.076	0.092	0.085	0.079	0.090
1994	0.106	0.096	0.116	0.079	0.073	0.085	0.080	0.076	0.085
1995	0.098	0.088	0.108	0.079	0.072	0.085	0.080	0.075	0.085
1996	0.097	0.088	0.106	0.075	0.069	0.082	0.074	0.069	0.078
1997	0.114	0.105	0.124	0.086	0.079	0.093	0.076	0.071	0.080
1998	0.118	0.102	0.135	0.085	0.077	0.094	0.076	0.071	0.081
1999	0.115	0.108	0.122	0.088	0.083	0.093	0.079	0.075	0.082
2000	0.109	0.102	0.116	0.083	0.078	0.087	0.075	0.072	0.078
2001	0.099	0.093	0.104	0.077	0.073	0.081	0.074	0.071	0.077
2002	0.106	0.099	0.113	0.082	0.078	0.087	0.074	0.071	0.078
2003	0.096	0.089	0.103	0.075	0.070	0.080	0.072	0.068	0.076
2004	0.103	0.094	0.112	0.081	0.075	0.087	0.076	0.071	0.080
2005	0.108	0.096	0.119	0.084	0.077	0.091	0.078	0.073	0.082
2006	0.099	0.090	0.107	0.078	0.072	0.083	0.076	0.072	0.080
2007	0.116	0.103	0.128	0.086	0.078	0.094	0.076	0.071	0.082
2008	0.107	0.096	0.117	0.085	0.077	0.093	0.078	0.073	0.082
2009	0.099	0.087	0.112	0.079	0.069	0.089	0.077	0.071	0.083
2010	0.099	0.092	0.106	0.080	0.074	0.086	0.075	0.071	0.080
2011	0.103	0.094	0.113	0.082	0.076	0.089	0.080	0.075	0.084
2012	0.108	0.098	0.118	0.081	0.074	0.088	0.071	0.066	0.076

Source: SOEP (v30), own calculations.

Table A.9: **Multidimensional poverty** (weighting scheme: $w_{inc} = \frac{1}{4}$, $w_{educ} = \frac{1}{4}$, $w_{time} = \frac{1}{4}$, and $w_{np-time} = \frac{1}{4}$)

	$\phi = 0$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.419	0.395	0.442	0.342	0.318	0.366	0.074	0.062	0.086
1992	0.408	0.383	0.434	0.329	0.305	0.353	0.064	0.054	0.074
1993	0.417	0.394	0.440	0.331	0.309	0.353	0.065	0.053	0.077
1994	0.405	0.381	0.429	0.322	0.299	0.346	0.051	0.042	0.061
1995	0.393	0.371	0.415	0.310	0.288	0.332	0.061	0.049	0.072
1996	0.382	0.356	0.408	0.301	0.279	0.323	0.046	0.035	0.056
1997	0.414	0.387	0.441	0.326	0.301	0.351	0.045	0.037	0.054
1998	0.411	0.386	0.436	0.327	0.304	0.350	0.055	0.042	0.068
1999	0.417	0.399	0.435	0.302	0.287	0.318	0.055	0.047	0.063
2000	0.402	0.384	0.421	0.313	0.296	0.330	0.057	0.049	0.066
2001	0.383	0.363	0.403	0.288	0.269	0.307	0.056	0.046	0.067
2002	0.398	0.376	0.420	0.318	0.297	0.340	0.057	0.046	0.068
2003	0.372	0.349	0.395	0.279	0.259	0.299	0.049	0.040	0.059
2004	0.379	0.354	0.404	0.281	0.258	0.304	0.056	0.045	0.068
2005	0.360	0.338	0.382	0.258	0.238	0.278	0.050	0.040	0.060
2006	0.309	0.287	0.331	0.226	0.207	0.245	0.044	0.034	0.054
2007	0.332	0.308	0.357	0.236	0.214	0.258	0.048	0.035	0.062
2008	0.342	0.313	0.371	0.262	0.235	0.289	0.047	0.034	0.061
2009	0.317	0.288	0.347	0.221	0.196	0.246	0.043	0.030	0.056
2010	0.289	0.268	0.310	0.206	0.187	0.225	0.030	0.021	0.039
2011	0.288	0.267	0.309	0.199	0.180	0.219	0.044	0.033	0.055
2012	0.294	0.269	0.320	0.207	0.183	0.230	0.026	0.018	0.034
	$\phi = 1$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.333	0.311	0.354	0.179	0.165	0.192	0.015	0.012	0.018
1992	0.325	0.303	0.347	0.170	0.157	0.183	0.014	0.011	0.018
1993	0.322	0.302	0.342	0.171	0.158	0.185	0.015	0.011	0.019
1994	0.312	0.291	0.334	0.163	0.151	0.176	0.012	0.009	0.015
1995	0.297	0.278	0.317	0.158	0.146	0.170	0.012	0.009	0.015
1996	0.287	0.266	0.307	0.148	0.136	0.161	0.010	0.007	0.012
1997	0.314	0.292	0.337	0.161	0.149	0.173	0.009	0.007	0.011
1998	0.320	0.299	0.341	0.165	0.152	0.177	0.011	0.008	0.015
1999	0.297	0.282	0.312	0.150	0.141	0.159	0.012	0.009	0.014
2000	0.300	0.284	0.315	0.153	0.144	0.162	0.011	0.009	0.013
2001	0.277	0.259	0.295	0.145	0.134	0.156	0.011	0.009	0.014
2002	0.301	0.281	0.321	0.158	0.146	0.170	0.009	0.007	0.011
2003	0.267	0.248	0.285	0.140	0.129	0.150	0.010	0.007	0.012
2004	0.271	0.251	0.291	0.140	0.127	0.152	0.010	0.007	0.013
2005	0.253	0.234	0.271	0.129	0.118	0.141	0.011	0.008	0.014
2006	0.213	0.196	0.229	0.107	0.097	0.116	0.008	0.005	0.011
2007	0.224	0.203	0.244	0.114	0.102	0.126	0.010	0.006	0.013
2008	0.249	0.224	0.274	0.129	0.114	0.144	0.010	0.006	0.014
2009	0.218	0.194	0.241	0.111	0.097	0.125	0.009	0.005	0.013
2010	0.199	0.181	0.217	0.098	0.088	0.108	0.006	0.004	0.008
2011	0.195	0.178	0.212	0.100	0.089	0.111	0.010	0.007	0.013
2012	0.204	0.182	0.226	0.099	0.086	0.112	0.004	0.002	0.006
	$\phi = 2$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.302	0.281	0.323	0.103	0.094	0.111	0.006	0.004	0.007
1992	0.294	0.273	0.315	0.097	0.089	0.105	0.006	0.004	0.008
1993	0.291	0.272	0.311	0.098	0.090	0.107	0.006	0.004	0.009
1994	0.281	0.260	0.301	0.092	0.084	0.099	0.005	0.003	0.007
1995	0.268	0.249	0.287	0.089	0.082	0.097	0.004	0.003	0.006
1996	0.258	0.238	0.277	0.083	0.075	0.091	0.003	0.002	0.005
1997	0.283	0.261	0.304	0.088	0.081	0.095	0.003	0.002	0.004
1998	0.288	0.268	0.308	0.092	0.084	0.100	0.004	0.002	0.005
1999	0.263	0.249	0.277	0.083	0.077	0.089	0.004	0.003	0.005
2000	0.268	0.253	0.283	0.085	0.079	0.091	0.004	0.003	0.005
2001	0.248	0.231	0.265	0.082	0.075	0.089	0.004	0.002	0.005
2002	0.270	0.252	0.289	0.090	0.082	0.097	0.003	0.002	0.003
2003	0.238	0.220	0.255	0.079	0.072	0.086	0.003	0.002	0.004
2004	0.242	0.223	0.261	0.078	0.070	0.086	0.003	0.002	0.005
2005	0.224	0.206	0.242	0.073	0.066	0.080	0.004	0.002	0.005
2006	0.188	0.172	0.204	0.059	0.052	0.066	0.003	0.001	0.004
2007	0.196	0.177	0.216	0.065	0.057	0.073	0.004	0.002	0.006
2008	0.223	0.199	0.247	0.073	0.063	0.083	0.003	0.002	0.005
2009	0.192	0.170	0.214	0.063	0.054	0.072	0.003	0.001	0.005
2010	0.176	0.159	0.193	0.054	0.047	0.060	0.002	0.001	0.003
2011	0.172	0.156	0.188	0.058	0.051	0.065	0.004	0.002	0.005
2012	0.179	0.158	0.199	0.055	0.047	0.063	0.001	0.001	0.002

Source: SOEP (v30), own calculations.

Table A.10: **Multidimensional poverty** (weighting scheme: $w_{inc} = \frac{1}{2}$, $w_{educ} = \frac{1}{6}$, $w_{time} = \frac{1}{6}$, and $w_{np-time} = \frac{1}{6}$)

	$\phi = 0$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.391	0.368	0.413	0.317	0.293	0.340	0.061	0.050	0.072
1992	0.382	0.358	0.407	0.303	0.279	0.326	0.054	0.046	0.062
1993	0.393	0.371	0.415	0.306	0.282	0.329	0.055	0.046	0.064
1994	0.388	0.366	0.411	0.297	0.276	0.318	0.045	0.036	0.054
1995	0.367	0.346	0.389	0.296	0.275	0.318	0.054	0.043	0.066
1996	0.357	0.333	0.381	0.282	0.258	0.306	0.039	0.029	0.049
1997	0.383	0.359	0.407	0.294	0.270	0.318	0.038	0.030	0.046
1998	0.388	0.365	0.411	0.300	0.278	0.322	0.049	0.037	0.060
1999	0.373	0.355	0.390	0.279	0.263	0.294	0.048	0.041	0.055
2000	0.380	0.362	0.399	0.281	0.264	0.298	0.051	0.043	0.059
2001	0.362	0.342	0.381	0.264	0.245	0.283	0.048	0.038	0.057
2002	0.384	0.360	0.407	0.304	0.281	0.327	0.052	0.042	0.062
2003	0.355	0.333	0.376	0.270	0.250	0.290	0.046	0.037	0.056
2004	0.359	0.336	0.383	0.264	0.242	0.286	0.048	0.038	0.058
2005	0.348	0.327	0.368	0.257	0.237	0.277	0.047	0.038	0.056
2006	0.295	0.273	0.318	0.208	0.188	0.227	0.035	0.025	0.045
2007	0.314	0.287	0.341	0.218	0.196	0.240	0.043	0.030	0.055
2008	0.320	0.293	0.347	0.242	0.216	0.267	0.043	0.029	0.056
2009	0.309	0.279	0.339	0.211	0.187	0.234	0.040	0.027	0.053
2010	0.280	0.258	0.301	0.185	0.167	0.204	0.029	0.020	0.038
2011	0.278	0.256	0.300	0.186	0.167	0.205	0.037	0.028	0.046
2012	0.288	0.260	0.315	0.191	0.167	0.214	0.021	0.014	0.028
	$\phi = 1$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.307	0.286	0.327	0.104	0.095	0.114	0.011	0.008	0.014
1992	0.299	0.278	0.320	0.099	0.091	0.107	0.011	0.008	0.014
1993	0.296	0.277	0.316	0.100	0.091	0.109	0.011	0.008	0.015
1994	0.289	0.269	0.309	0.098	0.090	0.106	0.010	0.007	0.013
1995	0.277	0.258	0.295	0.094	0.085	0.102	0.010	0.007	0.012
1996	0.264	0.245	0.283	0.085	0.076	0.094	0.007	0.005	0.010
1997	0.287	0.266	0.309	0.090	0.083	0.097	0.007	0.005	0.008
1998	0.293	0.273	0.313	0.096	0.087	0.105	0.009	0.006	0.011
1999	0.271	0.257	0.285	0.086	0.080	0.093	0.009	0.007	0.011
2000	0.278	0.263	0.293	0.089	0.082	0.096	0.009	0.007	0.011
2001	0.255	0.239	0.272	0.086	0.078	0.094	0.009	0.007	0.011
2002	0.281	0.262	0.300	0.098	0.089	0.106	0.008	0.006	0.010
2003	0.250	0.233	0.268	0.085	0.077	0.092	0.008	0.006	0.010
2004	0.253	0.234	0.271	0.084	0.075	0.093	0.009	0.006	0.011
2005	0.238	0.221	0.256	0.079	0.072	0.087	0.009	0.006	0.012
2006	0.197	0.181	0.213	0.063	0.056	0.071	0.007	0.004	0.009
2007	0.205	0.185	0.225	0.069	0.062	0.077	0.008	0.005	0.011
2008	0.230	0.206	0.254	0.077	0.067	0.088	0.008	0.005	0.011
2009	0.201	0.179	0.223	0.068	0.059	0.077	0.008	0.005	0.012
2010	0.184	0.168	0.201	0.060	0.052	0.067	0.005	0.004	0.007
2011	0.180	0.164	0.197	0.063	0.055	0.070	0.008	0.005	0.011
2012	0.187	0.166	0.207	0.058	0.050	0.067	0.003	0.002	0.005
	$\phi = 2$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.268	0.249	0.287	0.045	0.039	0.050	0.004	0.002	0.005
1992	0.261	0.242	0.280	0.042	0.038	0.047	0.004	0.002	0.006
1993	0.259	0.241	0.276	0.043	0.038	0.048	0.004	0.003	0.006
1994	0.250	0.231	0.268	0.042	0.037	0.046	0.004	0.002	0.005
1995	0.240	0.223	0.257	0.040	0.035	0.045	0.003	0.002	0.004
1996	0.229	0.211	0.246	0.035	0.030	0.039	0.002	0.001	0.004
1997	0.249	0.230	0.269	0.035	0.032	0.038	0.002	0.001	0.003
1998	0.256	0.237	0.274	0.040	0.035	0.044	0.003	0.002	0.004
1999	0.233	0.221	0.246	0.036	0.032	0.039	0.003	0.002	0.004
2000	0.241	0.227	0.254	0.037	0.033	0.041	0.003	0.002	0.004
2001	0.221	0.206	0.236	0.036	0.032	0.040	0.003	0.002	0.004
2002	0.243	0.226	0.260	0.042	0.037	0.047	0.002	0.002	0.003
2003	0.214	0.199	0.230	0.036	0.032	0.040	0.002	0.001	0.003
2004	0.217	0.200	0.234	0.036	0.031	0.041	0.003	0.002	0.004
2005	0.202	0.186	0.219	0.034	0.029	0.038	0.003	0.001	0.004
2006	0.168	0.154	0.183	0.027	0.022	0.031	0.002	0.001	0.003
2007	0.175	0.157	0.193	0.031	0.026	0.035	0.003	0.002	0.004
2008	0.199	0.177	0.221	0.033	0.027	0.039	0.002	0.001	0.004
2009	0.172	0.152	0.192	0.029	0.024	0.035	0.003	0.001	0.004
2010	0.157	0.142	0.173	0.025	0.022	0.029	0.002	0.001	0.002
2011	0.154	0.139	0.169	0.028	0.024	0.033	0.003	0.002	0.004
2012	0.159	0.140	0.178	0.024	0.020	0.028	0.001	0.000	0.001

Source: SOEP (v30), own calculations.

Table A.11: **Multidimensional poverty** (weighting scheme: $w_{inc} = \frac{3}{4}$, $w_{educ} = \frac{1}{12}$, $w_{time} = \frac{1}{12}$, and $w_{np-time} = \frac{1}{12}$)

	$\phi = 0$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.391	0.347	0.393	0.163	0.145	0.180	0.047	0.036	0.059
1992	0.382	0.336	0.385	0.164	0.146	0.183	0.039	0.032	0.046
1993	0.393	0.346	0.391	0.178	0.158	0.198	0.045	0.037	0.054
1994	0.388	0.357	0.400	0.177	0.161	0.193	0.048	0.038	0.058
1995	0.367	0.344	0.387	0.179	0.159	0.199	0.046	0.037	0.055
1996	0.357	0.314	0.363	0.162	0.143	0.181	0.032	0.025	0.039
1997	0.383	0.339	0.386	0.159	0.143	0.175	0.025	0.019	0.032
1998	0.388	0.344	0.390	0.177	0.157	0.197	0.037	0.027	0.047
1999	0.373	0.334	0.368	0.170	0.156	0.183	0.043	0.036	0.049
2000	0.380	0.346	0.382	0.171	0.155	0.187	0.048	0.039	0.057
2001	0.362	0.320	0.358	0.171	0.154	0.188	0.041	0.032	0.050
2002	0.384	0.347	0.392	0.190	0.171	0.208	0.050	0.040	0.059
2003	0.355	0.320	0.362	0.192	0.173	0.211	0.041	0.032	0.050
2004	0.359	0.337	0.380	0.183	0.163	0.203	0.046	0.035	0.056
2005	0.348	0.318	0.360	0.194	0.176	0.212	0.052	0.042	0.061
2006	0.295	0.272	0.316	0.143	0.126	0.161	0.040	0.029	0.050
2007	0.314	0.274	0.326	0.168	0.150	0.186	0.044	0.032	0.056
2008	0.320	0.287	0.339	0.161	0.141	0.182	0.042	0.029	0.054
2009	0.309	0.265	0.319	0.158	0.138	0.177	0.048	0.034	0.061
2010	0.280	0.258	0.302	0.146	0.129	0.164	0.033	0.025	0.040
2011	0.278	0.248	0.290	0.156	0.139	0.174	0.041	0.031	0.051
2012	0.288	0.263	0.316	0.145	0.125	0.165	0.026	0.018	0.033
	$\phi = 1$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.261	0.243	0.279	0.040	0.033	0.046	0.008	0.005	0.010
1992	0.255	0.237	0.273	0.039	0.033	0.045	0.008	0.005	0.010
1993	0.254	0.237	0.271	0.039	0.034	0.044	0.008	0.006	0.010
1994	0.248	0.232	0.265	0.044	0.038	0.050	0.008	0.006	0.010
1995	0.239	0.223	0.255	0.042	0.036	0.048	0.007	0.005	0.009
1996	0.227	0.210	0.244	0.035	0.030	0.040	0.005	0.003	0.007
1997	0.244	0.226	0.262	0.031	0.027	0.035	0.004	0.003	0.006
1998	0.253	0.235	0.270	0.038	0.032	0.043	0.005	0.004	0.007
1999	0.233	0.220	0.245	0.036	0.033	0.040	0.007	0.006	0.009
2000	0.242	0.229	0.255	0.040	0.035	0.045	0.008	0.006	0.010
2001	0.222	0.208	0.237	0.036	0.032	0.041	0.007	0.006	0.009
2002	0.245	0.229	0.262	0.047	0.041	0.053	0.009	0.007	0.011
2003	0.220	0.205	0.235	0.043	0.037	0.049	0.007	0.005	0.009
2004	0.222	0.206	0.238	0.041	0.035	0.046	0.008	0.005	0.010
2005	0.210	0.195	0.226	0.042	0.037	0.047	0.008	0.006	0.011
2006	0.173	0.159	0.187	0.032	0.027	0.037	0.006	0.004	0.008
2007	0.180	0.163	0.198	0.035	0.030	0.040	0.007	0.004	0.010
2008	0.201	0.180	0.221	0.036	0.029	0.043	0.006	0.004	0.009
2009	0.178	0.159	0.197	0.034	0.028	0.041	0.008	0.005	0.011
2010	0.164	0.149	0.178	0.032	0.027	0.036	0.005	0.003	0.006
2011	0.160	0.146	0.174	0.034	0.029	0.039	0.006	0.004	0.008
2012	0.166	0.148	0.184	0.026	0.022	0.030	0.003	0.002	0.004
	$\phi = 2$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.197	0.183	0.211	0.016	0.011	0.020	0.002	0.001	0.003
1992	0.193	0.179	0.207	0.014	0.011	0.017	0.003	0.001	0.004
1993	0.192	0.178	0.205	0.014	0.011	0.016	0.002	0.001	0.003
1994	0.184	0.171	0.197	0.017	0.014	0.021	0.002	0.002	0.003
1995	0.177	0.165	0.189	0.015	0.012	0.019	0.002	0.001	0.003
1996	0.169	0.157	0.182	0.012	0.010	0.015	0.002	0.001	0.003
1997	0.183	0.169	0.196	0.010	0.008	0.012	0.001	0.001	0.002
1998	0.191	0.177	0.205	0.012	0.010	0.014	0.001	0.001	0.002
1999	0.174	0.165	0.184	0.012	0.011	0.014	0.002	0.002	0.003
2000	0.183	0.173	0.193	0.015	0.013	0.018	0.002	0.002	0.003
2001	0.167	0.156	0.179	0.013	0.011	0.015	0.002	0.001	0.003
2002	0.186	0.173	0.199	0.019	0.016	0.022	0.002	0.002	0.003
2003	0.165	0.153	0.176	0.016	0.012	0.019	0.002	0.001	0.003
2004	0.166	0.153	0.179	0.015	0.012	0.017	0.002	0.001	0.003
2005	0.155	0.143	0.167	0.015	0.012	0.017	0.002	0.001	0.003
2006	0.129	0.118	0.140	0.011	0.009	0.013	0.001	0.001	0.002
2007	0.134	0.120	0.148	0.012	0.009	0.015	0.002	0.001	0.003
2008	0.151	0.135	0.168	0.013	0.009	0.016	0.002	0.001	0.003
2009	0.132	0.117	0.148	0.012	0.009	0.015	0.002	0.001	0.003
2010	0.122	0.110	0.133	0.011	0.009	0.013	0.001	0.001	0.002
2011	0.119	0.107	0.130	0.011	0.010	0.013	0.002	0.001	0.002
2012	0.123	0.109	0.137	0.008	0.007	0.010	0.001	0.000	0.001

Source: SOEP (v30), own calculations.

Table A.12: **Multidimensional poverty** (weighting scheme: $w_{inc} = \frac{9}{10}$, $w_{educ} = \frac{1}{30}$, $w_{time} = \frac{1}{30}$, and $w_{np-time} = \frac{1}{30}$)

	$\phi = 0$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.368	0.344	0.391	0.098	0.083	0.112	0.048	0.036	0.060
1992	0.361	0.337	0.385	0.098	0.081	0.115	0.046	0.036	0.056
1993	0.365	0.343	0.387	0.112	0.097	0.128	0.055	0.045	0.065
1994	0.377	0.356	0.399	0.139	0.125	0.154	0.060	0.048	0.071
1995	0.362	0.341	0.383	0.131	0.113	0.148	0.065	0.053	0.078
1996	0.340	0.315	0.365	0.104	0.091	0.118	0.050	0.041	0.059
1997	0.361	0.338	0.385	0.099	0.084	0.114	0.037	0.029	0.044
1998	0.373	0.351	0.395	0.114	0.099	0.128	0.048	0.038	0.057
1999	0.347	0.331	0.364	0.121	0.111	0.132	0.059	0.051	0.067
2000	0.360	0.342	0.379	0.126	0.112	0.139	0.062	0.052	0.072
2001	0.339	0.321	0.357	0.121	0.107	0.134	0.063	0.053	0.074
2002	0.365	0.342	0.387	0.147	0.131	0.162	0.081	0.068	0.093
2003	0.344	0.323	0.365	0.142	0.125	0.160	0.076	0.062	0.089
2004	0.358	0.337	0.379	0.147	0.131	0.163	0.073	0.060	0.085
2005	0.339	0.318	0.359	0.152	0.136	0.169	0.080	0.068	0.093
2006	0.294	0.271	0.316	0.135	0.119	0.152	0.057	0.045	0.069
2007	0.301	0.275	0.327	0.137	0.120	0.154	0.054	0.042	0.066
2008	0.315	0.288	0.341	0.127	0.109	0.145	0.054	0.041	0.068
2009	0.294	0.267	0.322	0.132	0.112	0.151	0.071	0.055	0.086
2010	0.285	0.263	0.306	0.129	0.114	0.144	0.057	0.047	0.067
2011	0.277	0.257	0.297	0.135	0.119	0.150	0.062	0.052	0.073
2012	0.294	0.268	0.321	0.128	0.109	0.148	0.043	0.034	0.052
	$\phi = 1$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.169	0.157	0.180	0.025	0.018	0.032	0.009	0.006	0.012
1992	0.167	0.154	0.179	0.025	0.018	0.031	0.008	0.006	0.011
1993	0.167	0.156	0.178	0.025	0.021	0.028	0.008	0.006	0.010
1994	0.164	0.154	0.175	0.033	0.028	0.038	0.011	0.008	0.013
1995	0.158	0.148	0.168	0.030	0.025	0.036	0.011	0.008	0.013
1996	0.150	0.139	0.161	0.026	0.021	0.030	0.007	0.005	0.010
1997	0.158	0.147	0.169	0.020	0.016	0.023	0.005	0.004	0.007
1998	0.169	0.157	0.181	0.025	0.020	0.029	0.006	0.005	0.008
1999	0.156	0.148	0.165	0.026	0.023	0.029	0.010	0.008	0.011
2000	0.166	0.157	0.175	0.031	0.026	0.036	0.012	0.009	0.015
2001	0.152	0.143	0.162	0.027	0.024	0.031	0.011	0.009	0.012
2002	0.172	0.160	0.184	0.038	0.032	0.043	0.015	0.012	0.018
2003	0.156	0.145	0.167	0.035	0.029	0.041	0.012	0.009	0.015
2004	0.157	0.145	0.168	0.034	0.029	0.038	0.012	0.010	0.014
2005	0.149	0.139	0.160	0.035	0.031	0.040	0.012	0.010	0.015
2006	0.123	0.114	0.133	0.027	0.023	0.031	0.009	0.006	0.011
2007	0.128	0.116	0.140	0.028	0.023	0.032	0.009	0.006	0.012
2008	0.139	0.125	0.154	0.026	0.021	0.032	0.009	0.006	0.012
2009	0.127	0.114	0.140	0.029	0.024	0.034	0.012	0.009	0.015
2010	0.118	0.108	0.128	0.028	0.024	0.032	0.008	0.006	0.010
2011	0.116	0.106	0.126	0.027	0.023	0.031	0.008	0.006	0.010
2012	0.120	0.108	0.132	0.024	0.020	0.027	0.006	0.005	0.008
	$\phi = 2$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.084	0.077	0.091	0.011	0.007	0.015	0.003	0.001	0.004
1992	0.083	0.076	0.090	0.010	0.007	0.013	0.003	0.002	0.004
1993	0.083	0.077	0.089	0.009	0.007	0.011	0.002	0.001	0.003
1994	0.081	0.075	0.087	0.014	0.011	0.017	0.003	0.002	0.004
1995	0.077	0.071	0.083	0.012	0.009	0.016	0.003	0.002	0.004
1996	0.073	0.068	0.079	0.010	0.007	0.012	0.002	0.001	0.003
1997	0.076	0.070	0.082	0.006	0.005	0.008	0.001	0.001	0.002
1998	0.085	0.078	0.092	0.008	0.006	0.010	0.001	0.001	0.002
1999	0.078	0.074	0.083	0.009	0.008	0.011	0.003	0.002	0.003
2000	0.085	0.080	0.091	0.013	0.010	0.015	0.004	0.003	0.005
2001	0.077	0.072	0.083	0.010	0.008	0.011	0.003	0.002	0.004
2002	0.091	0.084	0.097	0.016	0.013	0.019	0.005	0.003	0.006
2003	0.081	0.074	0.087	0.014	0.010	0.017	0.003	0.002	0.005
2004	0.080	0.074	0.087	0.012	0.010	0.014	0.003	0.002	0.004
2005	0.075	0.069	0.081	0.012	0.010	0.015	0.003	0.002	0.004
2006	0.062	0.057	0.068	0.009	0.007	0.011	0.002	0.001	0.003
2007	0.065	0.059	0.072	0.009	0.007	0.012	0.003	0.001	0.004
2008	0.072	0.064	0.080	0.009	0.007	0.012	0.002	0.001	0.003
2009	0.065	0.057	0.072	0.010	0.007	0.012	0.003	0.002	0.004
2010	0.061	0.055	0.067	0.009	0.007	0.011	0.002	0.001	0.003
2011	0.059	0.054	0.065	0.009	0.007	0.010	0.002	0.001	0.003
2012	0.061	0.054	0.068	0.007	0.006	0.009	0.001	0.001	0.002

Source: SOEP (v30), own calculations.

Table A.13: **Multidimensional poverty** (weighting scheme: $w_{inc} = \frac{1}{3}$, $w_{educ} = \frac{1}{3}$, $w_{time} = \frac{1}{3}$, and $w_{np-time} = 0$)

	$\phi = 0$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.182	0.166	0.198	0.097	0.087	0.107	0.054	0.045	0.062
1992	0.181	0.162	0.200	0.114	0.099	0.128	0.054	0.045	0.064
1993	0.183	0.164	0.201	0.112	0.097	0.128	0.064	0.052	0.076
1994	0.186	0.166	0.205	0.107	0.093	0.121	0.057	0.048	0.066
1995	0.170	0.151	0.188	0.101	0.086	0.116	0.052	0.041	0.063
1996	0.182	0.162	0.202	0.108	0.093	0.123	0.049	0.039	0.059
1997	0.206	0.187	0.224	0.114	0.100	0.127	0.051	0.041	0.061
1998	0.196	0.173	0.218	0.124	0.107	0.141	0.049	0.039	0.059
1999	0.216	0.202	0.231	0.128	0.116	0.140	0.059	0.051	0.068
2000	0.205	0.191	0.220	0.137	0.125	0.150	0.058	0.050	0.067
2001	0.208	0.192	0.223	0.126	0.113	0.139	0.055	0.047	0.063
2002	0.208	0.191	0.226	0.135	0.121	0.149	0.069	0.059	0.079
2003	0.200	0.181	0.219	0.128	0.114	0.142	0.067	0.055	0.079
2004	0.208	0.187	0.230	0.131	0.112	0.149	0.066	0.054	0.078
2005	0.201	0.183	0.219	0.128	0.112	0.144	0.068	0.055	0.081
2006	0.184	0.166	0.203	0.117	0.102	0.133	0.063	0.050	0.077
2007	0.213	0.190	0.235	0.136	0.117	0.155	0.069	0.054	0.085
2008	0.192	0.172	0.212	0.124	0.106	0.143	0.067	0.053	0.081
2009	0.192	0.169	0.216	0.115	0.096	0.133	0.072	0.057	0.087
2010	0.175	0.159	0.192	0.111	0.096	0.126	0.056	0.045	0.067
2011	0.185	0.166	0.204	0.119	0.103	0.135	0.067	0.054	0.080
2012	0.196	0.176	0.216	0.107	0.089	0.124	0.049	0.038	0.060
	$\phi = 1$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.070	0.061	0.078	0.034	0.028	0.039	0.014	0.011	0.017
1992	0.080	0.069	0.092	0.042	0.035	0.050	0.016	0.013	0.020
1993	0.073	0.063	0.083	0.039	0.032	0.046	0.017	0.013	0.021
1994	0.073	0.064	0.082	0.037	0.031	0.044	0.016	0.013	0.020
1995	0.063	0.054	0.073	0.031	0.025	0.038	0.016	0.011	0.020
1996	0.064	0.056	0.072	0.032	0.026	0.037	0.013	0.009	0.017
1997	0.082	0.072	0.092	0.043	0.036	0.050	0.013	0.010	0.016
1998	0.083	0.072	0.095	0.042	0.035	0.050	0.014	0.009	0.018
1999	0.082	0.075	0.089	0.041	0.036	0.046	0.016	0.013	0.018
2000	0.083	0.076	0.091	0.043	0.038	0.048	0.015	0.013	0.017
2001	0.071	0.065	0.078	0.035	0.031	0.039	0.014	0.011	0.017
2002	0.081	0.073	0.089	0.043	0.037	0.049	0.016	0.012	0.019
2003	0.071	0.062	0.080	0.038	0.032	0.045	0.017	0.013	0.021
2004	0.075	0.064	0.087	0.042	0.034	0.050	0.017	0.012	0.021
2005	0.072	0.062	0.082	0.038	0.031	0.046	0.016	0.012	0.020
2006	0.066	0.057	0.075	0.035	0.029	0.041	0.014	0.010	0.018
2007	0.076	0.065	0.087	0.041	0.034	0.048	0.016	0.011	0.020
2008	0.078	0.066	0.090	0.043	0.035	0.052	0.015	0.011	0.019
2009	0.072	0.059	0.086	0.038	0.028	0.048	0.017	0.012	0.022
2010	0.066	0.058	0.074	0.033	0.028	0.039	0.011	0.009	0.014
2011	0.068	0.058	0.078	0.037	0.029	0.044	0.017	0.013	0.021
2012	0.077	0.065	0.090	0.038	0.030	0.047	0.014	0.009	0.018
	$\phi = 2$								
	$\beta = -1$			$\beta = 0$			$\beta = 1$		
Year	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval	Coeff.	Conf.	Interval
1991	0.045	0.038	0.052	0.020	0.016	0.024	0.007	0.005	0.009
1992	0.056	0.047	0.066	0.026	0.021	0.031	0.008	0.006	0.010
1993	0.048	0.040	0.057	0.024	0.018	0.029	0.007	0.005	0.009
1994	0.048	0.040	0.055	0.022	0.018	0.027	0.008	0.005	0.010
1995	0.039	0.031	0.047	0.018	0.014	0.023	0.007	0.005	0.009
1996	0.040	0.033	0.046	0.017	0.013	0.021	0.006	0.004	0.008
1997	0.055	0.047	0.064	0.025	0.020	0.029	0.006	0.004	0.007
1998	0.055	0.046	0.064	0.024	0.019	0.029	0.006	0.003	0.009
1999	0.051	0.045	0.057	0.023	0.019	0.026	0.007	0.005	0.008
2000	0.055	0.049	0.062	0.024	0.020	0.027	0.006	0.005	0.008
2001	0.043	0.038	0.048	0.019	0.016	0.022	0.006	0.004	0.008
2002	0.052	0.045	0.059	0.024	0.019	0.028	0.007	0.004	0.009
2003	0.044	0.037	0.052	0.021	0.016	0.026	0.007	0.005	0.009
2004	0.049	0.039	0.058	0.023	0.017	0.029	0.006	0.004	0.009
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2008	0.054	0.044	0.065	0.025	0.019	0.031	0.006	0.004	0.008
2009	0.047	0.035	0.059	0.022	0.015	0.029	0.006	0.003	0.009
2010	0.043	0.036	0.050	0.018	0.015	0.022	0.004	0.003	0.005
2011	0.045	0.036	0.054	0.021	0.016	0.026	0.007	0.005	0.009
2012	0.053	0.042	0.065	0.022	0.016	0.029	0.007	0.003	0.010

Source: SOEP (v30), own calculations.

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