Chapter 5

Swords or plowshares?
The recent literature on
endogenous property rights

$\mathcal{P}$ROTECTION of property rights is widely regarded as a costly process. There are a number of papers (although not as many as one might expect) which address the emergence of property rights according to the resources devoted to it. This chapter presents a selection of these and points to some of the key differences with regard to the model in chapter (6).

> "The efforts of men are utilized in two different ways: they are directed to the production or transformation of economic goods, or else to the appropriation of goods by others" (Pareto, 1906, p 341).

The title of this chapter is borrowed in parts from the 1995 article by Herschel Grossman and Minseong Kim and draws on Vilfredo Pareto's famous characterisation. Economic agents are free to allocate a limited supply of resources towards production (plowshares) or appropriative activities (swords). Moreover, the models in this chapter concentrate on a specific feature of institutional quality, namely the ability to protect property. A low degree of property rights protection creates incentives to invest into swords because it becomes more attractive to seize one's neighbour's property and more urgent to defend one's own. Such an allocation, in turn, reduces economic output because production receives less attention.

Economies are usually populated by 2 representative individuals or groups, who devote effort to either of these activities in order to maximise individ-

ual welfare. The individual who opts for appropriation takes resources from the other individual and lowers their welfare. In anticipation of this, the other individual might either defend his or herself, perhaps discouraging appropriation in the first place; accept the loss; or start appropriating on his or her own behalf. The economy can therefore be characterised by co-operation, conflict, or somewhere in between, among its citizens. This is usually explained in a game-theoretical analysis.[1] A high level of protection of property rights may be both cause and consequence of domestic cooperation. Since conflict usually leads to the destruction of otherwise valuable resources, a low level of conflict and a high level of cooperation is often associated with a more affluent society, a result in line with the empirical findings of section (4.4) and the theoretical model of chapter (6). The canonical general equilibrium model stems from Trygve Haavelmo (1954, pp 91-98).

5.1   Emergence of property rights between cooperation and conflict

One important line of research analyses the emergence of property rights as the allocation of resources among productive and predatory activities, following the canonical model by Trygve Haavelmo (1954). The versions by Stergios Skaperdas (1992) and Herschel Grossman (Grossman and Kim, 1995; Grossman, 2001) share the joint feature that there is no authority which coerces compliance with the rules of the game. Hence, individuals have to arrange themselves. If people abstain from predatory or appropriative actions—a cooperative equilibrium—total welfare is usually highest and claims to property are secure. The first steps towards good institutions are taken.

These models differ in their specification of the initial allocation of resources. While Skaperdas (1992) and section 1 of Grossman (2001) work with resources in a common pool which is subject to predation by the parties, the second section of Grossman (2001) and earlier Messrs Grossman and Kim (1995) attribute an initial allocation of resources towards the parties, who defend their initial claims and may challenge the claims of others. The first version is arguably better suited to illustrate the emergence of institutions in a historical context, where people fought over the possession of

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[1]Also known as the evolution of cooperation in repeated versions of the prisoner's dilemma (Skaperdas, 1992, p 720).

initially non-allocated natural resources such as deer, fish, or minerals, while the second version offers more insights for today's development problems.

The following sections present a condensed models for both a common pool of resources and initially allocated claims, in order to illustrate the basics of these approaches. The exposition follows Grossman (2001); please note that the original notation was used which may overlap with previous notation.

5.1.1   Common pool of resources

The economy shall consist of $n + 1$ agents with identical characteristics and endowed with one unit of time each ($n \in \{1, 2, 3, ...\}$). The common pool consists of $(n + 1)E$ divisible units of resources. Each agent devotes his unit of time towards the appropriation of resources from the common pool and producing an inalienable consumption good. Let r_i denote the appropriation effort of agent i and l_i the effort spend for production with $r_i + l_i = 1$. Moreover, let e_i denote the amount of resources appropriated from the common pool:

$$e_i = \frac{r_i}{r_i + \sum_{j \neq i} r_j}(n + 1)E \tag{5.1}$$

Equation (5.1) says that agent i gets more resources the more effort he devotes to appropriation ($r_i \uparrow \rightarrow e_i \uparrow$) relative to the efforts of other agents ($\sum_{j \neq i} r_j \uparrow \rightarrow e_i \downarrow$). The fraction of resources obtained by i equals the ratio between his or her and the general effort. Agent i's consumption is thus:

$$c_i = e_i^\alpha \, l_i^{1-\alpha} \tag{5.2}$$

Equation (5.2) assumes a standard Cobb-Douglas technology with $0 < \alpha < 1$. Agent i maximises consumption by solving the following first-order condition, which states that marginal benefits of r_i and l_i in increasing consumption must be equal:

$$\frac{\mathrm{d}c_i}{\mathrm{d}r_i} = \frac{\partial c_i}{\partial e_i}\frac{\partial e_i}{\partial r_i} - \frac{\partial c_i}{\partial l_i} \stackrel{!}{=} 0 \tag{5.3}$$

The equilibrium allocation of effort towards appropriation and production follows from (5.1) and (5.2):

$$\frac{\partial c_i}{\partial e_i} = \alpha \, e_i^{\alpha-1} \, l_i^{1-\alpha} \tag{5.4}$$

$$\frac{\partial e_i}{\partial r_i} = (n+1) \, E \frac{\sum_{j \neq i} r_j}{\left(r_i + \sum_{j \neq i} r_j\right)^2} \tag{5.5}$$

$$\frac{\partial c_i}{\partial l_i} = (1-\alpha) \, e_i^{\alpha} \, l_i^{-\alpha} \tag{5.6}$$

Using (5.3):

$$(1-\alpha) \, e_i^{\alpha} \, l_i^{-\alpha} = \alpha \, e_i^{\alpha-1} \, l_i^{1-\alpha} \, (n+1) \, E \frac{\sum_{j \neq i} r_j}{\left(r_i + \sum_{j \neq i} r_j\right)^2} \tag{5.7}$$

Since individuals are identical: $\sum_{j \neq i} r_j = n \, r_i$, therefore

$$\frac{r_i}{l_i} = \left(\frac{n}{n+1}\right)\left(\frac{\alpha}{1-\alpha}\right). \tag{5.8}$$

It shows that people engage more in predatory activities the higher n or the higher α are—ie, the input elasticity of appropriated resources to consumption. Moreover, unlike in the Skaperdas model, there is no equilibrium where nobody appropriates because individual consumption would then be zero (5.2). What is probably more surprising is that (5.8) does not depends on the size of the cake, the per capita resources in the common pool, E. The reason is that both activities, predation and production, have returns which increase proportionally with E (Grossman, 2001, p 349).

There are some overlaps between this model and the notion of costly development institutions as described in section (4.3). Here, individual agents run for an as-large-as-possible share of the common pool of resources, but resources have to be wasted because there are no institutions in place which would allocate the common pool in an observable, verifiable, and enforceable way. It is easy to see from equation (5.1) that all agents receive the same amount E from the pool when all invest the same to appropriative actions—which is assumed by the symmetry among agents. If institutions were in place which would infuse order into this run, for instance, by making a binding and unchallengeable uniform allocation, every agent would receive E as well without diverting time to appropriation. Consumption would be higher.

5.1.2 Initial allocation of claims

This section's model assumes that resources are allocated to the agents, who may defend their claims, challenge other agents' claims, or engage directly in the production of consumption. For the sake of brevity, assume that there are only two agents, i and j with $i, j = 1, 2$, who are able to retain a fraction p_i and p_j of their initial claims, E, equal for both agents. Thus, p is a proxy for the security of property rights because with $p_i = 1$ agent i would keep its entire property. Actually, i receives the fraction p_i of his own initial claim and the fraction $1 - p_j$ of j's claims:

$$e_i = p_i E + (1 - p_j)E \tag{5.9}$$

with

$$p_i = \begin{cases} \frac{1}{1 + \theta \frac{g_j}{h_i}} & \text{for } g_i > 0, 0 < \theta < 1 \\ 1 & \text{for } g_i = 0 \end{cases} \tag{5.10}$$

Equation (5.10) determines the security of i's claims as a result of j's effort, g_j, to challenge his claims, and i's effort, h_i, to defend them. Claims are fully secure only if j abstains completely from predation—ie, if $g_j = 0$. The parameter θ represents the effectiveness of offensive actions versus defense. It may be interpreted as a technology parameter, which increases with better attack weaponry, eg the invention of cannons, and decreases with improvements in defense, eg the fortress design of Sébastian Le Prestre de Vauban (Grossman and Kim, 1995, p 1279). It might also include social institutions and norms which facilitate or hinder appropriation (Grossman, 2001, p 350).

Agent i and j face the same Cobb-Douglas technology in producing their consumption good as in equation (5.2). Agent i maximises his consumption by allocating his effort towards predation, g_i, defense, h_i, and production, l_i, subject to $g_i + h_i + l_i = 1$. In making his choices he takes the allocation of j towards g_j and h_j as given. The first-order solutions for i are:

$$\frac{\partial c_i}{\partial h_i} = \frac{\partial c_i}{\partial e_i}\frac{\partial e_i}{\partial h_i} - \frac{\partial c_i}{\partial l_i} \overset{!}{=} 0 \tag{5.11}$$

$$\frac{\partial c_i}{\partial g_i} = \frac{\partial c_i}{\partial e_i}\frac{\partial e_i}{\partial g_i} - \frac{\partial c_i}{\partial l_i} \overset{!}{=} 0 \tag{5.12}$$

The optimisation is straightforward and the equilibrium allocation of efforts by i and j is thus:

$$h_i = g_j = \left(\frac{\alpha}{1-\alpha}\right)\left(\frac{\theta}{(1+\theta)^2}\right) l_i \qquad (5.13)$$

Equation (5.13) shows that in equilibrium, i's challenging efforts are matched by the same effort by j in defense—ie, $g_i = h_j$—and vice versa. Both increase with θ and α, because an increase in θ makes attack more rewarding and defense more urgent. The results on α and E are similar to those obtained in the previous section (Grossman, 2001, pp 349-351).

Sections (5.1.1) and (5.1.2) present very stylised versions of ideas which are elaborated in more depth elsewhere. For instance Messrs Grossman and Kim include a parameter β in their analysis which measures the destructiveness of predation (Grossman and Kim, 1995, p 1279). This parameter allows creating a cooperative equilibrium where agents are discouraged from appropriation if the destructiveness is sufficiently high (Grossman and Kim, 1995, p 1287).

5.2   Rise and decline

A second line of research on endogenous property rights is more akin to Mancur Olson's vision of rising and declining nations (Olson, 1982). It subscribes to the view that protection of property is costly, and that private parties devote their own resources to it. However, an increase in investments to protect private property must not necessarily be socially efficient, because it might distort prices and utilisation of less protected resources (de Meza and Gould, 1992), or because emerging interest groups, which increasingly protect their own claims. This has the effect of heralding the erosion of property rights (Tornell, 1993).

Page 75 of this book features a quote from Herschel Grossman, who argues that locking one's door is a good way to protect private property. And the costs of door-locking are entirely borne by the house owner. Previous arguments favour tight security, because it hampers potentially destructive activities such as burglary and allows house owners to amass precious furnishing without fear of theft, if they want to. While houses become more expensive, home security may even become cheaper in relative term—ie, owners spend a smaller fraction of the house value to locks and alarms—because technology enables the more efficient protection of property. High security may deter would-be burglars from trying this career in the first

place and encourage them to look for a more respectable job; another socially welcome effect.

However, there may be a downside to individually tight security in that it might divert burglars' attention towards less protected estates (de Meza and Gould, 1992, pp 577-578). People who initially preferred a relaxed stance to security because they are less risk averse or own less precious assets might face increased criminal pressure because the remaining crooks concentrate on those houses where security is lowest. As a consequence they might in turn step up in security themselves and thereby boost the pressure on the less secured homes in the neighbourhood. One by one, each household may go domino and tighten security in face of the ever mounting criminal threat. In the end, each household may have installed a fully fledged security system, even if some of them may not have wanted it initially. The social cost is, thus, a possible over-investment in home security, because the aggregated level of security surpassed the optimum. Hence, upgrading individual security may have positive as well as negative externalities, and there may be cases where the negative externality dominates the positive.[2]

Another line of argument follows Olson's vision more closely, and provides an explicit microfoundation. The 1993 paper by Aaron Tornell applies an Ak growth model—ie, a growth model where capital has constant instead of diminishing returns, as in standard models—with three different regimes of property rights: (i) common property, where all groups of the society (the already familiar agents i and j) have access to the entire capital stock; (ii) private property, where i and j have access to their own capital only; and (iii) a leader-follower regime, where the leader (either i or j) has access to the entire capital stock, leaving the follower with nothing. Each group can trigger a regime switch by incurring a one-time loss. The economy starts with common property, a historical legacy; as soon as one group invests in a switch, the economy turns to leader-follower, where the switching group becomes the leader. The regime turns to private property if the other group matches this move—ie, undertakes a similar action. Another move by either group turns the economy again to leader-follower, and then back to common property if it is matched by the other group. An illustrative example is for instance the erection of a wall by one group, which triggers the switch from common property to leader-follower, because the wall-builders can now con-

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[2]In the example by Messrs de Meza and Gould such is the case, if the marginal social benefit curve is not monotonic, but shaped in a way that people prefer few or no houses with alarm rather than complete coverage with alarm (de Meza and Gould, 1992, pp 578 & 571).

trol the entire capital stock, while defending their own.[3] The matching move
by the other group could be building a wall of their own; and since both
parties now defend their tenure, a regime of private property emerges. De-
molishing the other group's wall could inflict the one-time loss necessary to
re-establish a leader-follower system again which turns to common property,
when the second group destroys the perpetrator's wall (Tornell, 1993, pp 2-3
). Mr Tornell—unlike other models—abstains from continuous investments
to property rights (think of the maintenance costs of the wall).

Each group develops a switching strategy, whose payoffs depend on the
capital stock. If the marginal product to capital and the elasticity of in-
tertemporal substitution is sufficiently high, then two threshold levels of
the capital stock may be distinguished: at the first threshold the economy
switches from common to private property, at the second it returns from
private to common property. These models provide an endogenous expla-
nation why societies change their regime of property rights protection over
time and, therefore, across different levels of economic prosperity.

Growth rates are generally higher for private than for common property.
However, the groups anticipate a forthcoming switch to either common or
private property and adjust their behaviour respectively. For instance, they
will reduce the level of appropriation when a switch to private property
is near. They already mimic their choices which prevail under the forth-
coming regime. The result is that growth rates increase when the economy
approaches a switch to private property; the growth rate jumps up at the
time of the switch, but then starts to decline in anticipation of another
switch back to common property (Tornell, 1993, p 31).

The special appeal of Mr Tornell's model is that it provides an explicitly
formulated explanation on why nations might lose their dynamic once they
become very wealthy. A blossoming welfare state and the emergence of
powerful special interest groups, which may be interpreted as a dilution of
private property rights, are indeed usual suspects for the decline of growth
rates in mature economies, especially when diminishing returns to capital
are ruled out through the application of an Ak model.

Despite its elegance, Mr Tornell's model has little to say to developing coun-
tries. The switching mechanism which creates the alterations in property-
rights regimes is simple, and the costs of a switch are a one-time loss only.

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[3]Another example could be the establishment of a partial legal system (Tornell, 1993,
p 9).

This is in contrast with the definition of institutions in chapter (4) which explicitly argues that good institutions need an ongoing effort of enforcement and redesign. However, the perspectives are different. While Mr Tornell's model explains ups and downs in the protection of property with respect to a rising capital endowment (in the spirit of a Kuznet-curve), this book focuses on the interaction between wealth and institutions during economic development. In particular, whether there may be development traps where countries are too poor to upgrade institutions, and where institutions are to poor to attract further investments.

5.3 Governance and growth

A final strand of literature, represented by a recent article by Mark Gradstein (2004), produces similar results to chapter (6), albeit with different assumptions and layout. Both share the focus on developing countries, and both determine two steady-states, with high incomes and good institutions or low incomes and poor institutions respectively, which may constitute a development trap.

Contrary to previous models, Mr Gradstein regards the interaction between growth and governance not as a conflict among competing interest groups but rather as the choice of rational individuals who have to decide whether to invest or consume. They divide their income between taxes, T, consumption, c_{it}, and investments, k_{it}, with the budget constraint y_{it}:

$$y_{it} = c_{it} + k_{it} + T\delta_t \qquad (5.14)$$

Subscript i denotes variables on the individual level, subscript t is a time index. Taxes are used to pay for law enforcement and are collectively set (Gradstein 2004, p 508), which circumvents by definition any collective-action problem, such as the one which is at the heart in sections (5.1.1) and (5.1.2). The indicator function δ_t becomes 1 with perfect institutions and 0 without investments to property rights. Each household devotes one unit of time towards productive w_{it}, and unproductive activities u_{it}:

$$1 = w_{it} + u_{it} \qquad (5.15)$$

With capital investments and productive activities as well as technology A (exogenously given, $A > 0$), next-period gross incomes are produced:

$$z_{it} = Ak_{it}^{\alpha}w_{it} \qquad (5.16)$$

L_t denotes the fraction of individual income that is protected. A fraction L_0 is protected according to social norms without any explicit costs. $Z_{t+1} = \int z_{it+1}\mathrm{d}i$ is the aggregate income, and $(1 - L_t)Z_{t+1}$ the fraction available for rent-seeking. An investment of u_{it} on rent-seeking returns the fraction $\frac{r(u_{it})}{\int r(u_{it})\mathrm{d}i}$ of aggregate income—ie, they receive a fraction according to their effort in relation to the effort of all others. Since the economy is populated by numerous individuals the impact of individual rent-seeking on aggregate rent-seeking is considered negligible.

Next-period net income, y_{it+1} is the sum of work-generated and rent-seeking receipts,

$$y_{it+1} = L_t z_{it} + (1 - L_t)Z_{t+1}\frac{r(u_{it})}{\int r(u_{it})\mathrm{d}i}, \tag{5.17}$$

which is passed to i's child. Utility is derived by consumption as well as the income transfer, with $0 < \beta < 1$:

$$V(c_{it}, y_{it+1}) = (1 - \beta)\log(c_{it}) + \beta\log(y_{it}) \tag{5.18}$$

The equilibria are determined by first determining the optimum allocation of time between work and rent-seeking, given the investment decision, and second the optimum investment choices given the time allocation. Moreover, parents are assumed to be identical and to make identical decisions which allows the aggregation of individual solutions.

The equilibrium solutions are then solved for the two cases:

- $L_t = L_0$—ie, where property is only protected by social norms and without explicit investments.

- $L_t = 1$—ie, with full protection of property rights.

The resulting utility levels are denoted by a superscript 0 ($L_t = L_0$) and 1 ($L_t = 1$):[4]

$$V_t^0 = (1 - \beta)\log\frac{(1 - \beta)(1 - L_0)y_t}{\alpha\beta L_0 + 1 - \beta} + \beta\log(A\left(\frac{\alpha\beta L_0 y_t}{\alpha\beta L_0 + 1 - \beta}\right)^\alpha(1 - u)) \tag{5.19}$$

$$V_t^1 = (1 - \beta)\log\frac{(1 - \beta)(y_t - T)}{\alpha\beta + 1 - \beta} + \beta\log(A\left(\frac{\alpha\beta(y_t - T)}{\alpha\beta + 1 - \beta}\right)^\alpha) \tag{5.20}$$

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[4]Please refer to Gradstein (2004, pp 508-510) for a detailed optimisation.

For a sufficiently high technology parameter A, the economy converges to a steady state, y^0 or y^1 respectively, under low or full protection of property rights (see figure 5.1).

Three propositions may be drawn from the analysis:

1. Minimal protection of property rights conveys higher current consumption, because no taxes have to be paid and investments are unattractive, but steady state income is lower.

2. A poor economy reaches a higher welfare level with low property rights protection; a rich economy prefers full protection. Since $L_0 > 0$ is delivered free of charge (eg, by social norms), its impact is stronger in poor countries.

3. There is a threshold level of income, y^{**}, which indicates indifference between low and full protection. If L_0 will be sufficiently small, y^{**} will exceed y^0, which means, that an economy which starts with a lower income and low protection of property rights will never opt for full protection because it would reduce its welfare.

There are two critical variables in Mr Gradstein's model which determine the emergence of property rights: the initial level of income and the fraction of income that is protected free of charge by social norms (L_0). Households will only switch to full protection if it improves welfare, which is only the case when incomes surpass the indifference level y^{**}. For incomes below y^{**} it is welfare maximising to spend nothing for property rights protection and to use only the free part L_0. The economy then proceeds to its steady state income, y^0, which will be below y^{**} if L_0 is sufficiently small—ie, when the economy is poorly endowed with social capital. In that case, the economy will never reach y^{**}, and hence, stick with poor property rights protection and a lower steady state income.

Bad institutions are not necessarily destructive because the appropriated fractions of income are distributed among rent-seeking individuals. But they distort investment decisions in favour of consumptions and rent-seeking, because future returns on investment are depressed. This eventually results in lower steady state income: $y^0 < y^1$. The variable L_t in this model, which denotes the fraction of protected income, may be interpreted as institutional quality.

Individuals are confronted with the choice between $L_t = L_0$ and $L_t = 1$, which they decide by maximising the concomitant utility levels. The concentration on two distinct levels of property-rights protection makes the
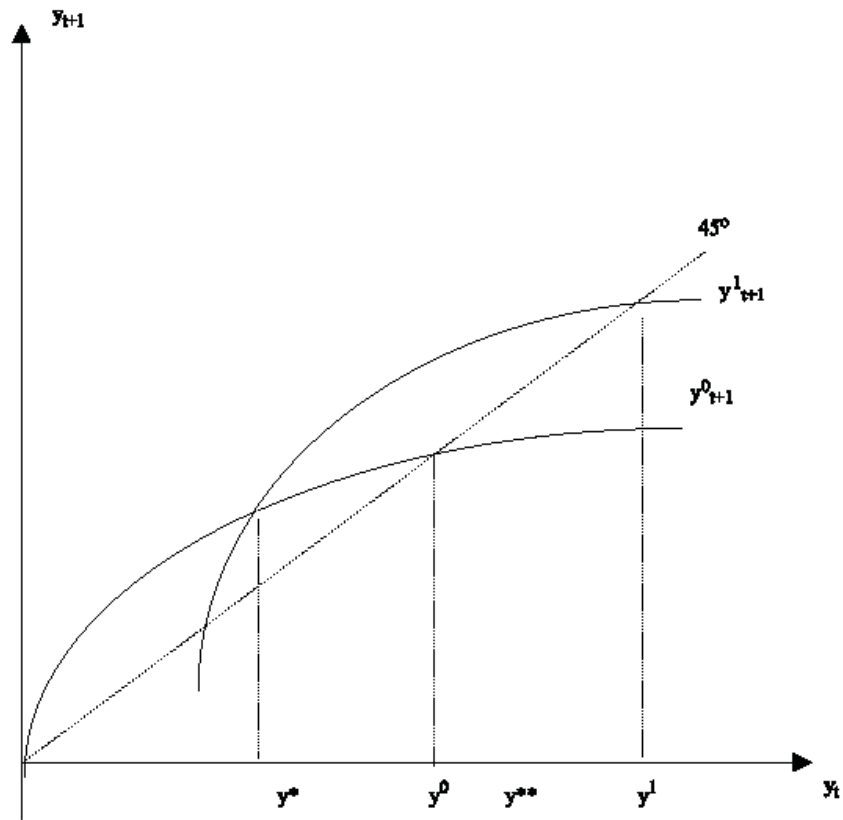
Figure 5.1: Gradstein (2004, p 511): Intertemporal income evolution

collective-action approach arguably more plausible because it reduces the necessary organisational effort. However, a gradual evolution of L_t appears more realistic. There is no convincing reason why economic agents might not choose a level of property-rights protection between the two offered extremes. Introducing a gradual evolution of L_t in Mr Gradstein's model might undermine the stability of the low-income steady-state, because households at an income $y_t < y^{**}$ might find an intermediate protection of property rights preferable to the present low level L_0 and to full protection which would be too expensive. The intermediate steady state income might suffice to pass y^{**} (investments become more attractive) and hence allow households to eventually embrace full protection. If that would be the case, then the model would lose much of its explanatory power for all economies would reach a high income steady state, which is apparently not in line with the empirical impression.

In contrast to previous models, Mr Gradstein illustrates a case with capital mobility, although his basic model operates in a closed economy. Capital mobility, in his view, is expressed through a change in the cost of capital, denoted with the variable p. The budget constraint (5.14) is now $y_t = c_t + pk_t + T\delta_t$. The higher p, the costlier are investments—ie, the costlier are capital movements. The initial budget constraint (5.14) is a special case with $p = 1$. If foreign capital is available at low costs, $p < 1$, and L_0 is small, then full protection becomes more attractive (Gradstein, 2004, p 514), because a low p attracts more investments which facilitate the passing of y^{**}. However, capital mobility in this model does not allow an import of foreign resources in order to overcome the low-income steady-state without sacrifices in contemporary consumption. The view is based on the assumption that the international capital market is imperfect, "so that a poor country cannot borrow resources to finance a better enforcement of property rights" (Gradstein 2004, p 516).

5.4 Summary and next steps

The ideas collected in this chapter share the notion that the protection of property is costly, and that individual agents or societal groups respond to the incentives and constraints set by the institutional environment. Section (4.2) illustrates how bad institutions translate into economic loss through various channels, for instance, because transactions are unobservable or property rights unenforceable. This chapter adds a number of microfoundations which exemplify such a loss. For instance, in the first approach, swords

v plowshares, resources are wasted on the appropriation and defence of a common or initially allocated pool of resources. The cake is not getting bigger, and during the fight for a fair share of it, agents divert effort away from otherwise productive usages, thereby depressing output. This loss could have been prevented if good institutions were in place which would have organised the allocation without fighting.

But there are also differences among the models and with respect to the notion of institutions as developed in chapter (4). The screening effort in section (4.3) thrives on individual contributions, and the accuracy of information increases the more is spent on screening. In this sense, individual screening has positive externalities. In the swords-v-plowshares models (5.1.1 and 5.1.2), private action is targeted in an opposing direction—ie, towards the appropriation of other people's resources. Hence, they have negative externalities.

The governance-and-growth model (5.3) is more in line with the screening idea because it allows for a low-income steady-state. A poor country may prefer to spend little on the protection of property rights and its resources are diverted towards consumption and rent-seeking. This in turn reduces growth, and the country may never come into a position where it prefers a high protection. The drawback of this analysis is that agents may only choose between two different levels of property-rights protection. A gradual choice would be more realistic.[5] Moreover, the proposed variant of capital mobility may mitigate the problem because it potentially reduces interest-rates, but it does not allow the import of foreign resources to overcome the development trap.

The next chapter develops a model which illustrates a possible interaction between good institutions and capital accumulation. It draws on many elements presented here, but also includes new features. The most important similarity is that poor institutions result in economic loss, and that the security of property rights—or the quality of institutions in more general—depends on the efforts devoted to it. Moreover, chapter (2) suggests that development traps are a suitable instrument to describe the failure of some of the poorest countries to converge in living-standard with the rich world. Therefore, the model follows the governance-and-growth model in allowing multiple equilibria and development traps.

Individual contributions to property-rights protection are assumed to have positive externalities on institutional quality. Negative externalities

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[5]This holds also for the rise-and-decline model.

are also considered, for instance, in the form that good institutions reduce the scope for fraud and corruption, which may be a loss to some. Since many economic agents may opt for different levels of property-rights protection, the resulting quality of institutions should evolve gradually as to accommodate as many different combinations as possible. Finally, capital mobility takes a more rigorous form: it not only reduces financing costs but also allows an unlimited resource import.