



# NOTA DI LAVORO

65.2011

---

**Autocracies and  
Development in a Global  
Economy:  
A Tale of Two Elites**

---

By **Anders Akerman**, Department of  
Economics, Stockholm University,  
Sweden

**Anna Larsson**, Department of  
Economics, Stockholm University,  
Sweden

**Alireza Naghavi**, UNIBO, University of  
Bologna, Italy and FEEM, Fondazione  
Eni Enrico Mattei, Italy

# Economy and Society

## Editor: Giuseppe Sammarco

### Autocracies and Development in a Global Economy: A Tale of Two Elites

By Anders Akerman, Department of Economics, Stockholm University, Sweden

Anna Larsson, Department of Economics, Stockholm University, Sweden  
Alireza Naghavi, UNIBO, University of Bologna, Italy and FEEM,  
Fondazione Eni Enrico Mattei, Italy

#### Summary

Data on the growth performances of countries with similar comparative (dis)advantage and political institutions reveal a striking variation across world regions. While some former autocracies such as the East Asian growth miracles have done remarkably well, others such as the Latin American economies have grown at much lower rates. In this paper, we propose a political economy explanation of these diverging paths of development by addressing the preferences of the country's political elite. We build a theoretical framework where factors of production owned by the political elites differ across countries. In each country, the incumbent autocrat will cater to the preferences of the elites when setting trade policy and the property rights regime. We show how stronger property rights may lead to capital accumulation and labor reallocation to the manufacturing sector. This, in turn, can lead to a shift in the comparative advantage, a decision to open up to trade and an inflow of more productive foreign capital. Consistent with a set of stylised facts on East Asia and Latin America, we argue that strong property rights are crucial for success upon globalization.

**Keywords:** Autocracy, Growth, Political Elites, Landowners, Capitalists, Growth Miracles, Trade, Comparative Advantage, Capital Mobility, Property Rights

**JEL Classification:** F10, F20, P14, P16, O10, O24

*We are grateful for helpful comments from seminar participants at Uppsala University.*

*Address for correspondence:*

Alireza Naghavi  
Universita di Bologna  
Dipartimento di Scienze Economiche  
Piazza Scaravilli 2  
Bologna 40126  
Italy  
Phone: +39 051 2098873  
Fax: +39 051 209 8040  
E-mail: alireza.naghavi@unibo.it

The opinions expressed in this paper do not necessarily reflect the position of  
Fondazione Eni Enrico Mattei  
Corso Magenta, 63, 20123 Milano (I), web site: [www.feem.it](http://www.feem.it), e-mail: [working.papers@feem.it](mailto:working.papers@feem.it)

# Autocracies and Development in a Global Economy: A Tale of Two Elites\*

Anders Akerman<sup>†</sup>      Anna Larsson<sup>‡</sup>      Alireza Naghavi<sup>§</sup>

June 2011

## Abstract

Data on the growth performances of countries with similar comparative (dis)advantage and political institutions reveal a striking variation across world regions. While some former autocracies such as the East Asian growth miracles have done remarkably well, others such as the Latin American economies have grown at much lower rates. In this paper, we propose a political economy explanation of these diverging paths of development by addressing the preferences of the country's political elite. We build a theoretical framework where factors of production owned by the political elites differ across countries. In each country, the incumbent autocrat will cater to the preferences of the elites when setting trade policy and the property rights regime. We show how stronger property rights may lead to capital accumulation and labor reallocation to the manufacturing sector. This, in turn, can lead to a shift in the comparative advantage, a decision to open up to trade and an inflow of more productive foreign capital. Consistent with a set of stylised facts on East Asia and Latin America, we argue that strong property rights are crucial for success upon globalization.

*JEL-Classification: F10, F20, P14, P16, O10, O24*

*Keywords: Autocracy, Growth, Political Elites, Landowners, Capitalists, Growth Miracles, Trade, Comparative Advantage, Capital Mobility, Property Rights*

---

\*We are grateful for helpful comments from seminar participants at Uppsala University.

<sup>†</sup>Department of Economics, Stockholm University, SE-106 91 Stockholm, Sweden. Phone: + 46 8 16 21 63. E-mail: anders.akerman@ne.su.se.

<sup>‡</sup>Department of Economics, Stockholm University, SE-106 91 Stockholm, Sweden. Phone: + 46 8 16 38 65. E-mail: anna.larsson@ne.su.se.

<sup>§</sup>Corresponding author: University of Bologna and FEEM, Department of Economics, Piazza Scaravilli 2, Bologna 40126, Italy. Phone: +39-209-8873, Fax: +39-209-8040, Email: alireza.naghavi@unibo.it.

# 1 Introduction

Data from the post World-War II era of globalisation reveal a striking variation in the growth performances of autocratic countries. Globalisation, it seems, has proved a successful growth strategy in some regions such as East Asia, but not in others, such as Latin America. While countries in both regions were non-democratic at the start of the post-war period, historical accounts suggest that East Asian autocracies differed from those in Latin America in that the political elites were capitalists in the former and land owners in the latter.<sup>1</sup> The entrenched influence of the elites is one explanation for the widely divergent policies implemented in the two regions. Drawing on existing hypotheses, historical data, stylised facts and empirical evidence, this paper puts forth a political economy model of a small, potentially open economy to explain how two similar economies that only differ with respect to the preferences of the political elite may embark on dramatically diverging growth paths.

We use a specific factors trade model characterised by the principles of comparative advantage to replicate a series of historical events and key stylised facts in Latin America and East Asia comprising the protection of property rights, trade liberalisation, the inflow of foreign capital, reallocation of labour to the manufacturing sector and the evolution of income.<sup>2</sup> The incumbent autocrat sets the trade regime and chooses whether or not to enforce property rights, thereby affecting the local investment climate and the ability to attract foreign investors. Despite several common traits and similar economic structures in the two regions, openness to trade appears to have been beneficial in the former but detrimental in the latter for growth.<sup>3</sup> We relate this to the appropriability argument, and argue that the success of an infant industry hinges on the existence of strong property rights that promote investment.<sup>4</sup> Our results suggest that comparative advantage and property rights interact in important ways and are crucial to long-run development and growth. Moreover, when it comes to trade liberalization as a growth strategy, *timing* appears to be key.

The analysis explains why many landed economies, notably those of Latin America, chose to open up to trade at an early stage of development and how this strategy led to weak property

---

<sup>1</sup> See Glaeser et al. (2004) and Falkinger and Grossman (2005) for some historical examples. The idea that autocrats may be heterogenous has been highlighted in Shen (2007) and Paltseva (2008) who distinguish between good and bad dictators. Larsson and Parente (2010) also introduce an autocrat with preferences in line with those of the political elite.

<sup>2</sup> Seminal papers on the specific factors model are Jones (1971), Samuelson (1971), Mussa (1974) and Neary (1978).

<sup>3</sup> Export-led growth is often credited as a key factor behind the East Asian success, see for instance Krueger (1985) and World Bank (1993).

<sup>4</sup> This feature is consistent with Nelson and Pack (1999), who identify entrepreneurship, innovation and learning as key factors that must accompany investments in order to achieve the desired long-run economic outcome.

rights, the alienation of foreign investors and economic stagnation. The intuition is as follows. Since the Latin American landed elite of the 20th century owned the abundant factor, they were in favour of an open economy. In autarky, the value of agricultural products is increasing in property rights and all interest groups in society favour strong institutions. However, in an open economy, prices are determined in the world market which triggers a domestic battle for labour. Under free trade, land owners will find labour more expensive when property rights are enforced since this will enable capitalists to pay higher wages. This disincentive results in weak property rights in an open economy governed by a landed autocrat, and explains why returns to capital remained low in Latin America, accounting for the region's inability to accumulate capital, promote its manufacturing sector, and catch up with the world market.<sup>5</sup> The mechanism could also help explain the failure of subsequent attempts to industrialise through infant-industry protection and import substitution following a history of weak property rights and an underdeveloped manufacturing sector.

The model also provides a rationale for why the capitalist-oriented East Asian economies chose to remain in autarky up to a point where they had accumulated sufficiently strong property rights and illustrates how this timely strategy triggered rapid capital accumulation, the inflow of productive foreign capital, and economic growth. With a comparative disadvantage in capital, the East Asian capitalists protected their economy and initially remained closed to the world market. Meanwhile, they favoured strong property rights, which spurred investments in new technologies and created high returns to capital. Such investments along with the inflow of new, efficient, capital from abroad set the necessary grounds for the growth of the infant industry in these economies. Subsequently, their manufacturing sector became competitive by world-market standards and gained the capacity to benefit from trade liberalisation. Policies adopted by the capitalist-oriented autocrats of East Asia thus shifted the comparative advantage towards manufacturing over time and were imperative for their economic success.

## History and Literature

At the beginning of the 20th century, most Latin American countries were considered relatively open to trade and specialised in exports of food and raw materials. The existence of attractive external markets for the region's primary exports benefited the landed elite. The ruling autocrats, who typically catered to the needs of the landowners, were therefore reluctant to implement policies conducive to industrialisation. In some countries, such as Brazil, European powers had enough

---

<sup>5</sup> Differently, Cervellati et al. (2011) show in a theoretical and empirical analysis how globalisation hampers the adoption of new, more productive technologies in autocratic countries.

leverage to force governments to allow for free trade. However, Latin America did not develop the entrepreneurial class, the infrastructure, the market size, the administrative capacity or the labour force necessary to cope with an extensive industrialisation process. The infant industries of Latin America refused to grow up despite repeated attempts to protect them by means of import substitution (Werner, 1972).

A large share of the previous studies attempting to explain the stagnation of Latin America identify the concentration of land ownership as a possible culprit. Engerman and Sokoloff (2000) for instance contrast the economic development in Latin America to that of the US. They argue that Latin America lagged behind as a result of extreme inequality in land ownership enabling the elite to enforce their self interests, an idea which is also present in Persson and Tabellini (1994). A related mechanism is emphasised in Galiani et al. (2008), who study investments in public education in land-abundant economies governed by landlords who do not engage in the production of manufacturing goods. They argue that such economies fail to sustain strong educational institutions since the elites do not benefit from more educated workers. On a similar note, Galor et al. (2009) show that inequality in land ownership may be detrimental to the emergence of institutions promoting human capital and may therefore delay industrialisation. Adamopoulos (2008) further relates policies that put barriers to capital accumulation or productivity to the landed elites lobbying to protect their rents in the rural economy when the distribution of land ownership is sufficiently concentrated.

History reveals that the East Asian economies pursued a different strategy. Although many of the economies in the region maintained trade barriers in terms of tariffs, they focused on promoting investment in the manufacturing industry by encouraging the adoption of new technologies. To this end, the East Asian economies invested heavily in R&D and programs aimed at promoting technology adoption and human capital accumulation. Domestic industries were, to some extent, protected from foreign competition, which helped them grow and compete. These policies led to rapid capital accumulation, an inflow of foreign capital and labour migration to the manufacturing sector which gradually shifted the comparative advantage of the region towards manufacturing. This shift in comparative advantage made openness to trade consistent with the preferences of the influential capitalists, thereby rendering the ruling autocrats increasingly pro-trade.<sup>6</sup> The trade

---

<sup>6</sup> Many of the growth miracle countries, who have doubled their income in a decade or less, were autocratic when the miracles began. Out of the five fastest growing countries 1950-2004 four were autocratic when their miracles began (Larsson and Parente, 2010). Out of this set, which comprises Singapore, Taiwan, South Korea, Botswana and Thailand, Botswana was the only democratic country. The East Asian economies were all autocratic.

liberalisation that followed has often been considered a turning point for the region as it paved the way for the miraculous growth performances of the East Asian Tigers (Anderson, 1983).

Many scholars argue that the East Asian miracle may be attributed to a carefully coordinated policy mix comprising government protection and export promotion. Rodrik (1994, 1996) argues that in East Asia, government policies helped establish a sound investment climate by increasing returns to capital, making investments attractive and increasing the demand for imported capital goods.<sup>7</sup> The notion that a capitalist autocrat may implement policies conducive to growth is consistent also with Galor and Moav (2006) who argue that capitalists have incentives to invest in upgrading the skills of the labour force as it raises the productivity of capital in the manufacturing sector.

Finally, our work is clearly also related to the vast more general literature on institutions, political regimes and economic performance, where important contributions include Acemoglu and Robinson (2000, 2001, 2006, 2007) Acemoglu et al. (2008), Aghion et al. (2007), Glaeser et al. (2004) and Persson and Tabellini (2009).<sup>8</sup> The idea that vested interest groups, along the lines of our political elites, may erect barriers to growth and development has been emphasised by Olson (1982), Krusell and Rios-Rull (1996), and Parente and Prescott (2002).

## Stylised Facts

Our work is inspired to replicate a set of stylised facts on the East Asian and Latin American economies. The East Asian sample comprises Korea, Malaysia, Singapore, Taiwan, Thailand and Hong Kong. The Latin American sample includes Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru and Venezuela.<sup>9</sup>

Figure 1 displays the revealed comparative advantage in the food and manufacturing sectors and the shares of exports produced in these two sectors over the period 1960-1978.<sup>10</sup> Comparing the two top panels, the graphs indicate that Latin America held a comparative advantage in food while East Asia held a comparative advantage in manufacturing relative to the other set of countries in

---

<sup>7</sup> See also Stiglitz (1996).

<sup>8</sup> See for instance Acemoglu and Robinson (2006) and Persson and Tabellini (2009) for overviews.

<sup>9</sup> This sample includes all Latin American economies for which data was available and the Newly Industrialised Countries in East Asia plus Malaysia and Thailand. We include the latter two to reinforce our point even if they have not experienced the extraordinary growth of the four Asian Tigers. In our context, these countries have also established a noteworthy move towards manufacturing and sound growth even if they have retained strong comparative advantage in food. On the contrary, Indonesia and Philippines (not included) has followed a different path as their comparative advantage lies on natural resources and food respectively.

<sup>10</sup> Source: elaborated by the authors with data from Anderson (1983) Table 3.

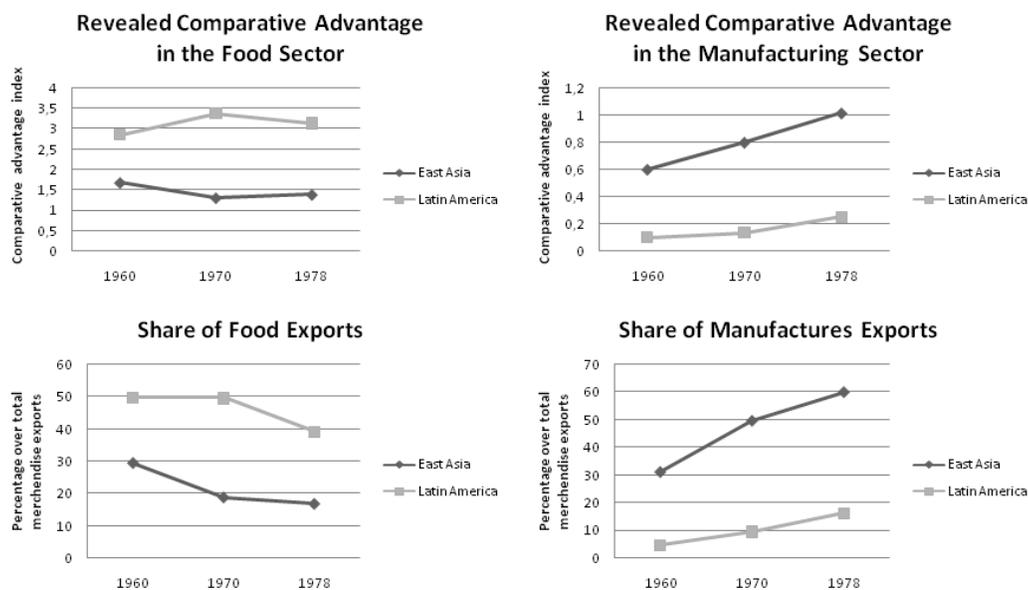


Figure 1: Comparative advantage in East Asia and Latin America. East Asia: Korea, Malaysia, Singapore, Taiwan, Thailand, Hong Kong. Latin America: Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Venezuela

this period.<sup>11</sup> The revealed comparative advantage is reflected in the bottom two panels depicting export shares of the two categories. The plots suggest that Latin America consistently had a higher share of food exports than East Asia, while the reverse holds true for manufacturing. The plots also suggest that, over time, the revealed comparative advantage and the share of exports in manufacturing increases remarkably more in East Asia than in Latin America.

Figure 2 displays the labour share in the industry, a property rights index and net capital inflows for both regions.<sup>12</sup> The top panel indicates that there was a gradual shift in labour towards the manufacturing sector from 1960 onwards in East Asia. This sectoral shift is much less pronounced for Latin America. The middle panel displays the average property rights index for the two re-

<sup>11</sup> Evidence suggests that East Asia, especially the four Asian Newly Industrialised Countries have experienced sharp increases in their comparative disadvantages in food vis-a-vis manufacturing.

<sup>12</sup> The plots are based on data from Anderson (1983) Table 2, Fraser Institute Economic Freedom World Index, and World Development Indicators respectively.

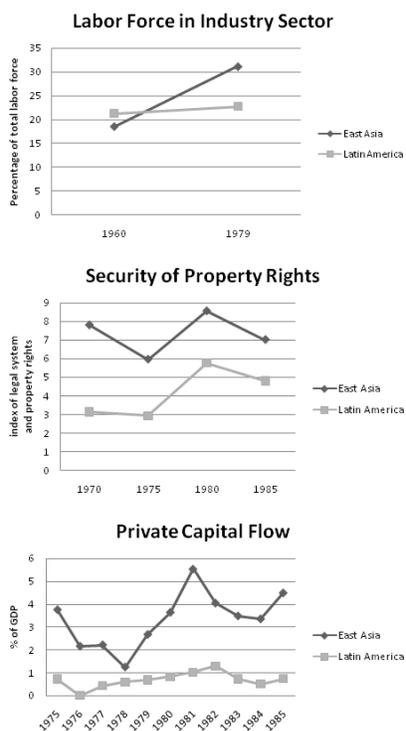


Figure 2: Labour flows, property rights and capital inflow in East Asia and Latin America

gions.<sup>13</sup> The graph suggests that property rights were consistently stronger in East Asia than in Latin America. From the mid 1980s onwards, there is a sharp increase in the index for the Asian economies. Finally, the bottom panel shows the surge in private capital flows towards East Asia in the late 1970's up to the early 1980's.<sup>14</sup>

The rest of the paper is organised as follows. Section 2 presents the model, Section 3 discusses the equilibrium under different trade regimes and Section 4 introduces international capital mobility. Section 5 presents the political-economy layer of the model and derives analytical results on optimal regimes and policies. Simulations are presented in Section 6. Discussion and concluding remarks are given in Sections 7 and 8 respectively.

<sup>13</sup> This is obtained from a sub-index Legal Structure and Security of Property Rights, which is intended to capture the security, protection, and enforcement of property rights.

<sup>14</sup> Sample does not include Taiwan and Hong Kong due to the lack of data on FDI.

## 2 The Model

Consider a small, potentially open economy. The economy consists of two sectors denoted  $j = A, M$  for agriculture and manufacturing. Each sector produces a sector-specific good that is tradable in the world market. There are three groups of households that differ in their initial endowments and supply either land, capital or labour to firms. We assume that each time period, denoted  $t$ , is one generation so that households and policy makers have one-period lives. A subgroup of households have warm-glow preferences, bequeathing a share of their income to their children.<sup>15</sup>

The economy is ruled by an autocrat who may be capitalist or landed in nature.<sup>16</sup> The autocrat has the power to decide the level of property rights, whether to maintain a closed or open economy and whether to allow for the inflow of foreign capital.

The timing of the model is such that at the beginning of each period, the autocrat decides on the regime and sets the level of property rights, taking into account how households and firms are going to respond. At the end of the period, everyone dies.

The model is solved by backward induction. In this section and in Sections 3 and 4, we therefore treat economic policy and the economic regime as exogenously given and focus on the optimal choices of households and firms (below) and the regime-specific equilibria (Sections 3 and 4). The preferences and optimal choices of the policy makers are then analysed in detail in Section 5.

### 2.1 Firms

The agriculture and manufacturing sectors differ in terms of technology and the factors employed in production. Labour is the only input used in both technologies and is perfectly mobile across the two sectors.

#### 2.1.1 Agriculture

The agricultural sector uses land ( $X$ ) and labour ( $L$ ) to produce the agricultural good. Letting  $Y_A$  denote the output of the agricultural good:

$$Y_{At} = X_t^\alpha L_{At}^{1-\alpha} \tag{1}$$

---

<sup>15</sup> The warm-glow preference structure enables us to characterise the equilibrium in each period. The bequests ensure that there is a dynamic link between periods and that the capital stock is growing over time.

<sup>16</sup> Modelling an autocracy rather than a democracy simplifies the political-economy layer of the model but without loss of generality: our results would obtain also in a democracy where the political elites could form a political lobby and exert pressure on the democratic leader. Persson and Tabellini (2002) build a model where the democratic leader caters to the lobbying group.

where  $\alpha \in (0, 1)$  and  $L_{At}$  denotes the labour employed in agriculture.

### 2.1.2 Manufacturing

The manufacturing sector uses capital ( $K$ ) and labour to produce the agricultural good:

$$Y_{Mt} = \pi_t (A_{Kt} K_{Dt} + K_{Ft})^\alpha L_{Mt}^{1-\alpha} \quad (2)$$

where  $K_{Dt}$  and  $K_{Ft}$  are domestic and foreign capital stocks, invested in the country we model. Note that the presence of foreign capital is contingent on domestic returns to capital being sufficiently high. This issue will be studied in detail in Section 4 but, for now, the level of foreign capital can be treated as exogenous.  $L_{Mt}$  refers to the labour employed in manufacturing. The parameter  $A_{Kt}$  denotes the productivity of domestic capital. We will later assume that  $A_{Kt}$  is a function of foreign capital, i.e. a measure of the degree of spillovers generated by capital inflows, but will maintain the notation  $A_{Kt}$  for the time being.<sup>17</sup>

## 2.2 Households

There are three different types of households, denoted  $h$ , in the economy. The three groups are workers ( $L$ ), capitalists ( $K$ ) and landowners ( $X$ ). Denote the number of workers, capitalists and landowners by  $L$ ,  $N_K$  and  $N_X$ , respectively. The total population at time  $t$  is denoted  $N_t = L_t + N_{Kt} + N_{Xt}$  and is normalised to one. We assume a stationary population as population growth is of no importance for the dynamics of interest in our setting.

### 2.2.1 Endowments

The three groups of households are endowed with only one of the three possible factor inputs in the economy: labour, land or capital. Workers are endowed with one unit of time and supply labour to firms, landowners hold one unit of land which they rent to firms in the agricultural sector and capitalists rent their capital to firms in the manufacturing sector.

The income of a worker in sector  $j$  is thus:

$$I_{Ljt} = w_{jt}. \quad (3)$$

where  $w$  denotes the wage.

---

<sup>17</sup> Note that we assume that the relative weight of labour in the production function,  $1 - \alpha$ , is the same in both sectors. The assumption is made for simplicity and is of minor importance: sectoral differences in terms of labour's share in production are not related to the dynamics of interest in our model.

The income of a capitalist is:

$$I_{Kt} = r_{Dt}k_t \tag{4}$$

where  $r_{Dt}$  denotes returns to domestic capital and  $k_t \equiv K_{Dt}/N_{Kt}$  is the capital endowment of each capitalist. The income of a landowner is:

$$I_{Xt} = r_{Xt} \tag{5}$$

where  $r_{Xt}$  denotes returns to land.

### 2.2.2 Preferences

Households differ with respect to their endowments, but also with respect to their preferences. We assume that the utility functions of workers and landowners are linear in consumption:

$$U_{ht}(C_t) = C_t,$$

for  $h = L, X$ , where

$$C_t = C_{At}^\sigma C_{Mt}^{1-\sigma}.$$

We assume that the land endowment is passed to the children of landowners at the end of the period.

Capitalists derive utility from consumption and from leaving bequests to their offspring. Their preferences are thereby characterised by a warm-glow utility and given by:

$$U_{Kt}(C_t, B_t) = C_t^\delta B_t^{1-\delta},$$

where  $B_t$  is the total amount of bequests of the capitalist household. For simplicity, we assume that bequests are produced using manufacturing goods.

### 2.2.3 Utility maximisation

Since workers and landowners have identical, linear utility functions these households simply consume their entire income. The indirect utility of a worker household employed in sector  $j$  is therefore:

$$V_{Ljt} = w_{jt}. \tag{6}$$

The indirect utility of a landowner is:

$$V_{Xt} = I_{Xt}. \tag{7}$$

The optimal choices of the capitalist household are:

$$C_{At} = \delta\sigma \frac{I_{Kt}}{P_{At}}, \quad (8)$$

$$C_{Mt} = \delta(1-\sigma) \frac{I_{Kt}}{P_{Mt}}, \quad (9)$$

$$B_t = (1-\delta) \frac{I_{Kt}}{P_{Mt}}. \quad (10)$$

The indirect utility of a capitalist household is therefore:

$$V_{Kt} = \tilde{\delta} \frac{I_{Kt}}{P_t}, \quad (11)$$

where  $\tilde{\delta} = (\delta\sigma)^{\delta\sigma} (\delta(1-\sigma))^{\delta(1-\sigma)} (1-\delta)^{(1-\delta)}$  and  $P_t = P_{At}^{\delta\sigma} P_{Mt}^{\delta(1-\sigma)} P_{Bt}^{(1-\delta)}$ .

### 2.2.4 Capital accumulation

There is full depreciation of capital in each period but capitalist households leave a share of their income as bequests to their children in the form of an investment good, denoted  $K_t$ , where  $K_t = B_{t-1}$ . The investment good cannot be consumed but must be used for investment in capital.

## 3 Equilibrium under Different Trade Regimes

This section solves for the equilibrium prices of goods, factor allocations, returns and output levels in the two sectors under different assumptions about the trade regime. We start by discussing general equilibrium conditions in Section 3.1, and proceed by discussing the equilibria in a closed and open economy, respectively in Sections 3.2 and 3.3.

### 3.1 General

Regardless of the trade regime, under full employment and inelastic labour supply, employment in the two sectors adds up to the total labour supply in the country:

$$L_t = L_{At} + L_{Mt}. \quad (12)$$

Due to perfect competition between firms, wages are equal to the marginal product of labour. Moreover, labour can move freely between the two sectors, equalising the wage across sectors:

$$w_t = w_{At} = w_{Mt} = P_{At} \frac{\partial Y_{At}}{\partial L_{At}} = \frac{\partial Y_{Mt}}{\partial L_{Mt}}, \quad (13)$$

where we have take the price of manufacturing as the numéraire.  $P_{At}$  therefore denotes the relative price of agricultural goods in terms of manufacturing goods.

### 3.2 Closed Economy

In autarky, domestic production equals domestic consumption in the agricultural sector. This implies:

$$Y_{At}^C = \frac{\sigma}{P_{At}^C} (w_t L_t + r_{Xt} X_t + \delta r_{Dt} K_{Dt}), \quad (14)$$

where the superindex  $C$  now denotes a closed economy.<sup>18</sup> The RHS denotes the expenditure on agriculture by workers, land owners and capitalists, respectively. Recall that capitalists spend a share  $\delta$  of their income on consumption (of which a share  $\sigma$  is spent on agricultural products).

The equivalent in the manufacturing sector is:

$$Y_{Ct}^M = (1 - \sigma) (w_t L_t + r_{Xt} X_t + \delta r_{Dt} K_{Dt}) + \overbrace{(1 - \delta) r_{Dt} K_{Dt}}^{\text{Used for bequests}} \quad (15)$$

where the second term on the RHS is the amount of manufacturing goods used for bequests.

The wage equality between the two sectors in equation (13), together with (1) and (2), give:

$$P_{At}^C = \pi_t \left( \frac{L_{At}^C}{L_{Mt}^C} \frac{A_{Kt} K_{Dt} + K_{Ft}}{X_t} \right)^\alpha. \quad (16)$$

Not surprisingly, agricultural goods are relatively more expensive if labour is relatively more productive in manufacturing, property rights are strong and if land is scarce relative to capital.

The wage equality condition in equation (16) and the goods market equilibria in equations (14) and (15) yield the relative labour allocation:

$$\frac{L_{At}^C}{L_{Mt}^C} = \frac{\sigma}{1 - \sigma} \left[ 1 - \alpha (1 - \delta) \frac{A_{Kt} K_{Dt}}{A_{Kt} K_{Dt} + K_{Ft}} \right], \quad (17)$$

As is standard in the specific factor model, in autarky, the relative labour allocation in the two sectors is independent of factor endowments (except for the term  $\frac{A_{Kt} K_{Dt}}{A_{Kt} K_{Dt} + K_{Ft}}$  which comes from the additional demand for manufacturing goods by capitalists leaving bequests to their children). This is because prices adjust in proportion to labour productivity in the two sectors. The term  $\frac{\sigma}{1 - \sigma}$  denotes the relative demand for agricultural goods and is positively related to the share of labour in agriculture. A lower  $\alpha$  indicates lower marginal returns to capital, and hence less resources to spend on bequests. This lowers demand for manufacturing and therefore also  $L_{Mt}^C$ .  $1 - \delta$  denotes the relative importance of bequests to capitalists. A higher value of  $(1 - \delta)$  reflects more expenditure on bequests and therefore a higher demand for manufacturing goods and labour in that sector. Finally, the term  $\frac{A_{Kt} K_{Dt}}{A_{Kt} K_{Dt} + K_{Ft}}$  captures the assumption that only domestic capital owners invest

<sup>18</sup> We only index the variables that are regime-specific in each period.  $L_t$  and  $K_{Dt}$  are history-dependent but they are nevertheless given at the start of each period.

in bequests. Therefore, the smaller the share of domestic capital in the economy, the lower the influence of bequests on the relative allocation of labour. In other words, the more important role foreign capital plays in the economy, the more workers will be employed in agriculture.

Equation (17) also allows us to rewrite the price equation in (16) as

$$P_{At}^C = \pi_t \left( \frac{\sigma}{1-\sigma} \right)^\alpha \left( \frac{A_{Kt}K_{Dt}(1-\alpha(1-\delta)) + K_{Ft}}{X_t} \right)^\alpha. \quad (18)$$

The returns to domestic capital and land are in turn given by the marginal product of these factors. Using the definition of output from (1) and (2), the relative price in (16), and the labour allocation derived from (12) and (17), returns can be summarised in the following Lemma

**Lemma 1** *Under autarky in goods trade, the returns to the domestic factors of production are:*

$$\begin{aligned} r_{Dt}^C &= \frac{\partial Y_{Mt}^C}{\partial K_{Dt}} = \pi_t \alpha (1-\sigma)^{1-\alpha} A_{Kt} \left( \frac{L_t}{A_{Kt}K_{Dt}(1-\sigma\alpha(1-\delta)) + K_{Ft}} \right)^{1-\alpha}, \\ r_{Xt}^C &= P_{At}^C \frac{\partial Y_{At}^C}{\partial X_t} = \pi_t \alpha \frac{\sigma}{(1-\sigma)^\alpha} \frac{L_t^{1-\alpha}}{X_t} \frac{A_{Kt}K_{Dt}(1-\alpha(1-\delta)) + K_{Ft}}{(A_{Kt}K_{Dt}(1-\sigma\alpha(1-\delta)) + K_{Ft})^{1-\alpha}}. \end{aligned}$$

The result suggests that the effect of foreign capital on the returns to domestic capital is ambiguous. It enters directly into the denominator since more foreign capital lowers the marginal productivity of domestic capital due to diminishing returns. However, it also enters the numerator through its technological spillovers on domestic capital, here captured by its effect on  $A_{Kt}$ . The net effect therefore depends on the exact nature of how foreign capital enters  $A_{Kt}$ . Moreover, a larger labour stock increases the returns to both capital and land by increasing the productivity of both factors in their specific sectors. Capital affects the returns to land, but land does not affect returns to capital. The reason for this is that more capital increases the relative price of agricultural goods, whereas manufacturing goods are used as the numéraire.

The institutional quality captured by the property-rights parameter,  $\pi_t$ , is important for the return to both factors of production, but through separate channels. Property rights raise the return to capital by affecting capital's marginal productivity. Land returns are also increasing in institutional quality (and with the same magnitude) but through an increase in the relative price rather than the marginal productivity in physical units. Lastly, the final term in the expression for returns to land highlights the role played by bequests and the fact that domestic capital owners pay their bequests in manufacturing goods. If bequests did not matter ( $\delta = 1$ ), this term would simplify greatly, but as long as they do matter and  $\delta \in (0, 1)$ , land returns are higher with more foreign capital since foreign capitalists do not give bequests.

It is also interesting to note that the relative return to domestic capital versus land is:

$$\frac{r_{Dt}^C}{r_{Xt}^C} = \frac{1 - \sigma}{\sigma} A_{Kt} \frac{X_t}{A_{Kt} K_{Dt} (1 - \alpha (1 - \delta)) + K_{Ft}} \quad (19)$$

which increases in the productivity of domestic capital and the relative scarcity of capital as compared to land (the latter effect is captured by the relative factor endowments  $\frac{X_t}{A_{Kt} K_{Dt} (1 - \alpha (1 - \delta)) + K_{Ft}}$ ). The net effect of foreign capital, however, is determined by the nature of spillovers captured by  $A_{Kt}$ . The relative demand for manufacturing goods, captured by the term  $(1 - \sigma)/\sigma$ , increases the relative returns to capital owners. Land owners carry a higher relative return when bequests are less important, i.e. when  $\delta$  is high. Note also that property rights do not matter for relative returns in autarky. This is because property rights simultaneously increase the productivity of capital, which increases the return to capital, and the relative price of agricultural goods, which increases the relative return to land. These two effects are of exactly the same magnitude and cancel out.

### 3.3 Open Economy

In an open economy, the relative price of agricultural goods to manufactures,  $P_{At}$ , is taken as exogenous and set equal to the world relative price  $P_{At}^*$ . In an open economy, the relative labour allocation in the two sectors is obtained by setting equation (16) equal to the world relative price:

$$\frac{L_{Mt}^O}{L_{At}^O} = \frac{\pi_t^{\frac{1}{\alpha}} (A_{Kt} K_{Dt} + K_{Ft})}{P_{At}^{*\frac{1}{\alpha}} X_t} \quad (20)$$

where superindex  $O$  denotes an open economy. We obtain:

$$L_{At}^O = L_t \frac{P_{At}^{*\frac{1}{\alpha}} X_t}{P_{At}^{*\frac{1}{\alpha}} X_t + \pi_t^{\frac{1}{\alpha}} (A_{Kt} K_{Dt} + K_{Ft})}$$

$$L_{Mt}^O = L_t \frac{\pi_t^{\frac{1}{\alpha}} (A_{Kt} K_{Dt} + K_{Ft})}{P_{At}^{*\frac{1}{\alpha}} X_t + \pi_t^{\frac{1}{\alpha}} (A_{Kt} K_{Dt} + K_{Ft})}$$

Under free trade in goods, the allocation of labour between the two sectors does indeed react to factor endowments. This is because prices do not change with factor endowments and cannot counterbalance their effects as they do in autarky. The relative allocation of labour in manufacturing increases with property rights, the capital stock and the productivity of labour in manufacturing. It decreases with the relative price of agricultural goods and the endowment of land. Using this information, we can conclude:

**Lemma 2** *In an open economy, an improvement in the property rights regime, accumulation of domestic capital, and the entry of foreign capital all shift labour from agriculture to manufacturing.*

Using (20) along with (12), we can derive the returns to domestic capital and land in an open economy:

**Lemma 3** *Under free trade in goods the returns to domestic factors are:*

$$\begin{aligned} r_{Dt}^O &= \pi_t^{\frac{1}{\alpha}} A_{Kt} \alpha \left( \frac{L_t}{P_{At}^{*\frac{1}{\alpha}} X_t + \pi_t^{\frac{1}{\alpha}} (A_{Kt} K_{Dt} + K_{Ft})} \right)^{1-\alpha}, \\ r_{Xt}^O &= \alpha P_{At}^{*\frac{1}{\alpha}} \left( \frac{L_t}{P_{At}^{*\frac{1}{\alpha}} X_t + \pi_t^{\frac{1}{\alpha}} (A_{Kt} K_{Dt} + K_{Ft})} \right)^{1-\alpha}. \end{aligned}$$

This Lemma provides some interesting insights which are all related to the allocation of labour under free trade. First, capitalists benefit from an improvement in property rights (since this raises their marginal productivity) while land owners do not (since this draws labour out of agriculture, which decreases the productivity of land). Moreover, capitalists lose from a higher price of agricultural goods while land owners gain. Finally, bequests do no longer play a role in the open economy since prices are fixed by foreign rather than domestic supply and demand.

## 4 Introducing International Capital Mobility

We next introduce international capital mobility and allow for the possibility that foreign (more productive) capital may flow into the country. We start by discussing the equilibrium implications for the closed economy in Section 4.1 below and proceed with the open economy in Section 4.2.

### 4.1 Closed Economy

The level of foreign capital,  $K_{Ft}$ , is determined by the potential returns it will generate in the country. Using equation (2) and Lemma 1, the returns to foreign capital in autarky are:

$$r_{Ft}^C = \frac{\partial Y_{Mt}^C}{\partial K_{Ft}^C} = \frac{r_{Dt}^C}{A_{Kt}^C}, \quad (21)$$

where  $\frac{\partial r_{Ft}^C}{\partial K_{Ft}^C} < 0$ .

The opportunity cost for foreign capital owners is the exogenous world interest rate,  $r_t^*$ . Therefore, foreign capital enters the country only if returns there are at least as high as the world interest rate. Since  $\frac{\partial r_{Ft}^C}{\partial K_{Ft}^C} < 0$ , it is sufficient to examine whether the latent return to the first unit of foreign capital entering the country satisfies this condition, i.e. if:

$$\tilde{r}_{Ft}^C \equiv \{r_{Ft}^C \mid K_{Ft}^C = 0\} = \pi_t \alpha \left( \frac{1 - \sigma}{1 - \sigma \alpha (1 - \delta)} \frac{L_t}{\tilde{A}_{Kt}^C K_{Dt}} \right)^{1-\alpha} > r_t^*, \quad (22)$$

where  $\tilde{r}_{Ft}^C$  is the latent return to foreign capital under autarky, and  $\tilde{A}_{Kt}^C$  the productivity of domestic capital when there is no foreign capital in the country, i.e. the lower bound of  $A_{Kt}^C$ . For simplicity, we normalise  $\tilde{A}_{Kt}^C$  to unity. Here, we note that the probability of foreign capital owners wishing to invest is increasing in property rights, the size of the labour force and the scarcity of domestic capital since all these three factors increase the productivity of capital employed in the country and result in a higher  $\tilde{r}_{Ft}^C$ .

Given  $\tilde{r}_{Ft}^C > r_t^*$ , a stock of foreign capital,  $K_{Ft}^C$ , will flow into the country until, in equilibrium,  $r_{Ft}^C$  has adjusted to the world interest rate,  $r_{Ft}^C = r_t^*$ . We can state:

**Lemma 4** *In a closed economy where  $\tilde{r}_{Ft}^C > r_t^*$ , the equilibrium level of foreign capital inflow that satisfies the interest rate parity condition  $r_{Ft}^C = r_t^*$  can be found using (21) and Lemma 1:*

$$K_{Ft}^C = \max \left\{ 0, (1 - \sigma) \left( \frac{\pi_t \alpha}{r_t^*} \right)^{\frac{1}{1-\alpha}} L_t - (1 - \sigma \alpha (1 - \delta)) A_{Kt}^C K_{Dt} \right\}. \quad (23)$$

The returns to the domestic factors of production become:

$$\begin{aligned} r_{Dt}^C &= A_{Kt}^C r_t^*, \\ r_{Xt}^C &= \sigma r_t^* \frac{\left( \frac{\pi_t \alpha}{r_t^*} \right)^{\frac{1}{1-\alpha}} L_t - \alpha (1 - \delta) A_{Kt}^C K_{Dt}}{X_t}, \end{aligned}$$

where the relative price  $P_{At}$  from (16) and the endogenous level of foreign capital from (23) have been used. The inflow of foreign capital is encouraged by strong property rights and the scarcity of domestic capital and land.

Note that if  $\tilde{r}_{Ft}^C \leq r_t^*$ , returns are evaluated by replacing  $K_{Ft} = 0$  in the respective factor returns in Lemma 1.

The result suggests that foreign capital will flow to larger countries since, in such countries, more capital is required for the returns to capital to comply with interest rate parity. Countries with a more productive manufacturing labour force and with stronger property rights will also attract more capital since the rate of return is higher in these countries. Countries with a large capital stock of their own, however, are characterised by lower returns to capital and are therefore less attractive to foreign investors.<sup>19</sup>

Lemma 1 also shows that foreign capital raises land returns through two channels: (i) it makes land more scarce and therefore raises its price, and (ii) it makes bequests less important relative to

<sup>19</sup>This follows since  $\sigma$ ,  $(1 - \delta)$  and  $\alpha$  are all less than unity.

total output, thereby lowering the demand for manufacturing.<sup>20</sup>

## 4.2 Open Economy

In an open economy, returns to capital can be calculated in a similar manner as under autarky, but by using Lemma 3 to obtain:

$$r_{Ft}^O = \frac{r_{Dt}^O}{A_{Kt}^O}. \quad (24)$$

The condition for foreign capital to flow into the country becomes:

$$\tilde{r}_{Ft}^O \equiv \{r_{Ft}^O \mid K_{Ft}^O = 0\} = \pi_t^{\frac{1}{\alpha}} \alpha \left( \frac{L_t}{P_{At}^{*\frac{1}{\alpha}} X_t + \pi_t^{\frac{1}{\alpha}} K_{Dt}} \right)^{1-\alpha} > r_t^*, \quad (25)$$

where  $\tilde{r}_{Ft}^O$  represents the latent return to the first unit of foreign capital in an open economy.

In addition to the variables that mattered under autarky, also land affects returns to capital in an open economy. More land will employ more labour in agriculture and leave fewer workers in manufacturing, resulting in a lower marginal productivity for capital.

If domestic returns to foreign capital are sufficiently high to satisfy  $\tilde{r}_{Ft}^O > r_t^*$ , there exists a stock of foreign capital,  $K_{Ft}^O$ , that makes domestic returns to capital equal to the world interest rate, i.e.  $r_{Ft}^O = r_t^*$ . Using equations (24) together with Lemma 3, we can deduce the following:

**Lemma 5** *If returns to foreign capital are sufficiently high so that  $\tilde{r}_{Ft}^O > r_t^*$  holds, the equilibrium level of foreign capital that satisfies the interest rate parity condition,  $r_{Ft}^O = r_t^*$ , is:*

$$K_{Ft}^O = \max \left\{ 0, \left( \pi_t \frac{\alpha}{r_t^*} \right)^{\frac{1}{1-\alpha}} L_t - \pi_t^{-\frac{1}{\alpha}} P_{At}^{*\frac{1}{\alpha}} X_t - A_{Kt}^O K_{Dt} \right\}, \quad (26)$$

yielding the following returns to the domestic factors of production:

$$\begin{aligned} r_{Dt}^O &= A_{Kt}^O r_t^*, \\ r_{Xt}^O &= \pi_t^{-\frac{1}{\alpha}} P_{At}^{*\frac{1}{\alpha}} r_t^*. \end{aligned}$$

*The inflow of foreign capital is thus encouraged by stronger property rights and scarcity of domestic capital.*

Note that if  $\tilde{r}_{Ft}^O \leq r_t^*$ , returns are evaluated by replacing  $K_{Ft} = 0$  in the respective factor returns in Lemma 3.

---

<sup>20</sup> Note also that we implicitly need to impose parameter restrictions such that  $r_{Xt}$  will always be greater than zero.

It is instructive to note that  $\tilde{r}_{Ft}^O$  is increasing in property rights. Although stronger property rights increase the demand for labour in the economy, they also increase returns to manufacturing and the latter effect always dominates. Therefore, the likelihood of an inflow of capital increases with the level of property rights. It is also the case that the larger the domestic capital stock, the less likely it is to attract foreign capital. And, finally, the likelihood of a positive capital inflow increases in the labour endowment of the country but decreases in the land endowment. The latter effect is due to the fact that the agricultural sector will compete more for the labour if the land endowment is large.

An interesting result for the return to land is that it is now independent of all factor endowments. This is because (i) goods prices are fixed so labour does not move between sectors, and (ii) foreign capital flows in at rates yielding a fixed return to domestic capital. This means that not only capital, but also land, has fixed returns when capital is flowing freely.

## 5 Political Economy

Having identified the economic equilibrium of the model for given trade policies and level of property rights, we next add a political layer and endogenise economic policy.

In what follows we will consider two economies. One where the political elite consists of the country's capital owners. In this economy, the ruling autocrat's preferences coincide with those of a representative capitalist. We refer to this economy as a capital autocracy. In the second type of economy, the political elite are the country's landlords. In analogy to the capital autocracy, the autocrat in this economy, in what follows referred to as a land autocracy, caters to the wishes of the landowners and their preferences coincide.<sup>21</sup>

Since capital and land endowments are given, we know from (4), (5), (7) and (11) that regimes regarding trade and property rights affect the objective of the ruling autocrat by changing the returns to capital and land. Since returns to capital are what governs the income of the capitalists in each economy and therefore bequests and aggregate saving, understanding how these regimes affect returns is key to understanding aggregate saving, capital accumulation, growth in manufacturing output and therefore the overall development of income and living standards in the two economies.

Below, we examine the implications of our model for the choices of autocrats and derive conditions for when each regime and policy will be chosen. We start by studying when each autocrat

---

<sup>21</sup> Alternatively we could assume that the autocrat is randomly drawn from the group of elites.

would choose to open up to trade in Section 5.1, proceed by deriving the optimal level of property rights in closed and open economies in Section 5.2 and study the autocrats' incentives to allow for the inflow of foreign capital in Section 5.3.

## 5.1 Trade Liberalisation

We start with the first stage of the model, where the ruling autocrat decides whether or not to open the economy to international trade. This sets up the baseline scenario on which decision on property rights protection is based. We assume an initial situation with no foreign capital so that  $K_{Ft} = 0$ , yielding  $A_{Kt} = \tilde{A}_{Kt} = 1$ .

Without foreign capital, a capital owner would prefer free trade if  $r_{Dt}^O > r_{Dt}^C$ . Using Lemmas 1 and 3 when  $K_{Ft} = 0$ , the inequality is satisfied when:

$$\pi_t^{\frac{1}{\alpha}} K_{Dt} > \frac{1 - \sigma}{\sigma(1 - (1 - \delta)\alpha)} P_{At}^{*\frac{1}{\alpha}} X_t. \quad (27)$$

The result allows us to draw some important conclusions. First, the productivity of capital in the manufacturing sector determines a capitalist's willingness to engage in trade. Stronger property rights make firms more competitive. In addition, the relative abundance of domestic capital in the economy shifts the interests of a capitalist autocrat towards free trade for reasons of comparative advantage. Second, the world relative price of manufacturing goods (inversely measured by  $P_{At}^{*\frac{1}{\alpha}}$ ) increases the willingness of capitalists to engage in trade. Third, more land in the economy increases the autarky price of manufacturing goods and lowers a capitalist's benefits from trade. Note also that the population size of a country does not affect the decision on trade.

For a land owner, the condition instead is  $r_{Xt}^O > r_{Xt}^C$ . Again, using Lemmas 1 and 3 we obtain:

$$\left(1 + \left[\frac{\pi_t}{P_{At}^*}\right]^{\frac{1}{\alpha}} \frac{K_{Dt}}{X_t}\right)^{1-\alpha} \left(\left[\frac{\pi_t}{P_{At}^*}\right]^{\frac{1}{\alpha}} \frac{K_{Dt}}{X_t}\right)^{\alpha} < \lambda \quad (28)$$

where  $\lambda \equiv \left(\frac{1-\sigma\alpha(1-\delta)}{\sigma(1-\alpha(1-\delta))}\right)^{1-\alpha} \left(\frac{1-\sigma}{\sigma}\right)^{\alpha}$ .

Condition (28) suggests that a land autocrat is more inclined to trade when (i) productivity in manufacturing is low (as captured by property rights); (ii) when relative world prices of agricultural goods,  $P_{At}^*$ , are high; (iii) the country is relatively well endowed with land (for reasons of comparative advantage).

We may formulate the following proposition.

**Proposition 1** *Given an initially low level of property rights protection  $\pi_0$ , a country with a comparative disadvantage in manufacturing (low  $\frac{K_{Dt}}{X_t}$ , high  $P_{At}^*$ ) opens to trade if ruled by a land autocrat, and remains closed under a capital autocrat.*

## 5.2 Property Rights

This section deals with how the ruling autocrat sets property rights for a given trade regime. The autocrat seeks to maximise his utility, taking into account how households and firms would react.

Looking at factor returns under the different regimes in Lemmas 1 and 3, we note that a capital owner will always benefit from stronger property rights as

$$\frac{\partial r_{Dt}^C}{\partial \pi_t} > 0, \quad \frac{\partial r_{Dt}^O}{\partial \pi_t} > 0.$$

This is because property rights raise the marginal productivity of capital. As for returns to land, given Proposition 1, a land autocrat in an open economy with the relative price of goods fixed at the level of world prices, prefers weaker property rights since

$$\frac{\partial r_{Xt}^O}{\partial \pi_t} < 0.$$

Property rights in this case lower the marginal productivity of labour in manufacturing and leaves more workers in the agricultural sector. In a closed economy, however, a land autocrat still favours improvements in property rights since this raises the relative price of agricultural goods:

$$\frac{\partial r_{Xt}^C}{\partial \pi_t} > 0.$$

Interestingly, it appears as if globalisation changes the incentives of the land autocrat in a way which is not beneficial for industrial growth.

**Proposition 2** *A capital autocrat always seeks to strengthen property rights regardless of whether the country is closed or open to trade ( $\frac{\partial r_{Dt}^C}{\partial \pi_t} > 0$ ,  $\frac{\partial r_{Dt}^O}{\partial \pi_t} > 0$ ). A landed autocrat chooses to enforce property rights in a closed economy ( $\frac{\partial r_{Xt}^C}{\partial \pi_t} > 0$ ), but prefers weak property rights in an open economy ( $\frac{\partial r_{Xt}^O}{\partial \pi_t} < 0$ ).*

## 5.3 Capital Market Liberalisation

We now turn to the autocrat's incentives to allow for the inflow of foreign capital. On the entry of foreign capital, what matters is not only whether the autocrat allows for capital inflows or not,

but also whether returns are such that the country is able to attract foreign capital. It is clear from Lemma (3) that an open land autocracy is against the entry of foreign capital:

$$\frac{dr_{Xt}^O}{dK_{Ft}} < 0.$$

A look back at Lemma (1) on the other hand shows that a capital autocracy would only be in favor of capital inflow if gains from productivity spillovers outweigh losses from the direct reduction in the marginal productivity of capital:

$$\frac{dr_{Dt}^C}{dK_{Ft}^C} > 0 \quad \text{if} \quad \frac{\partial r_{Dt}^C}{\partial A_{Kt}^C} \frac{\partial A_{Kt}^C}{\partial K_{Ft}^C} > \frac{\partial r_{Dt}^C}{\partial K_{Ft}^C}.$$

We therefore focus on the attractiveness of capital to study the moment when capital may enter in our small developing economy given the trade and property right policies enforced by the ruling elite.<sup>22</sup>

Using equations (22) and (5), we define

$$\tilde{R} = \frac{\tilde{r}_{Ft}^O}{\tilde{r}_{Ft}^C} = \pi_t^{\frac{1-\alpha}{\alpha}} \left( \frac{\phi K_{Dt}}{P_{At}^{*\frac{1}{\alpha}} X_t + \pi_t^{\frac{1}{\alpha}} K_{Dt}} \right)^{1-\alpha},$$

where  $\phi = \frac{1-\sigma}{1-\sigma\alpha(1-\delta)}$ , as the relative latent return to foreign capital in an open vis-a-vis a closed economy. Recalling that in an open and closed economy, respectively,  $\tilde{r}_{Ft}^O > r_t^*$  and  $\tilde{r}_{Ft}^C > r_t^*$  must hold for a positive inflow of foreign capital to occur, we can deduce from the FOC of  $\tilde{R}$  with respect  $\pi_t$  and  $K_{Dt}$  that:

**Proposition 3** *A small open economy is more likely to attract foreign capital than a closed one when property rights are sufficiently strong (since  $\frac{\partial \tilde{R}}{\partial \pi_t} > 0$ ) and/or when the capital-to-land ratio is sufficiently high (since  $\frac{\partial \tilde{R}}{\partial K_{Dt}} > 0$ ).*

A higher value of  $\tilde{R}$  makes it more likely for  $\tilde{r}_{Ft}^O$  than  $\tilde{r}_{Ft}^C$  to surpass the world capital rate of return,  $r_t^*$ . Stronger property rights make inward capital flows more likely in an open economy because the foreign capital lowers the marginal product of capital while leaving relative prices intact. The role played by domestic capital can be explained by bequests (note that the effect disappears if  $\delta = 1$ ). In a closed economy, foreign capital will lead to bequests playing a smaller role and therefore also lower relative demand, and the price, for manufacturing goods. Finally, the role of land is due to the fact that when prices are fixed outside the country, the factors are

---

<sup>22</sup> For a thorough analysis of the endogenous interest of the ruling elite towards inward foreign direct investment see Albornoz et al. (2008).

competing for domestic labour, while this not the case in autarky due to the balancing effect of relative prices.

These results suggest that trade in goods and factor mobility are complements for a developing economy. This is because an improvement in institutions and the accumulation of capital make it more likely for a small developing economy to both open to trade and liberalise capital markets. These findings are in line with Antras and Caballero (2009) in the sense that in a less financially developed economy, trade and capital mobility are complements. In his model, trade integration increases returns to capital and makes the country more attractive to foreign investors.<sup>23</sup>

## 6 Simulations

We next turn to numerical simulations aimed at illustrating key mechanisms in the model. The objective of this section is to study how the chosen property rights regime affects the elites' decision to open up to trade and potentially allow for the inflow of capital. Ultimately, we are interested in dynamic insights that cannot be immediately deduced from the propositions and lemmas in the analytical part.

We continue to consider two economies that are identical in terms of initial conditions and differ only with respect to the nature of the political elite and therefore with respect to the objective function of the ruling autocrat.

We start by simulating the benchmark model in Section 6.2, and then study the effects of negative price shock in terms of a sudden drop in the world-market relative price of agricultural goods in Section 6.3.

### 6.1 Parameters

As explained in the theory section, we make the simplifying assumption that land's share in agricultural production,  $\alpha$ , is equally large as capital's share in manufacturing production. We adopt the parameterisation of Hansen and Prescott (2002) for the share of land in agricultural production and set this parameter to .3.<sup>24</sup> The weight on agricultural goods in the consumption aggregate,  $\sigma$ , is set to .20. The capitalist's weight on consumption is set to .65, implying that they bequeath 35

---

<sup>23</sup> See also Jones and Neary (1984), Markusen (1983), Markusen and Svensson (1985), Neary (1995), and Wong (1986) on the substitutability or complementarity of trade in goods and factors.

<sup>24</sup> The setup of Hansen and Prescott (2002) differs somewhat from ours as they allow for a capital input also in the agricultural sector. Moreover, they set the capital share in manufacturing to .4 and the land share in agriculture to .3.

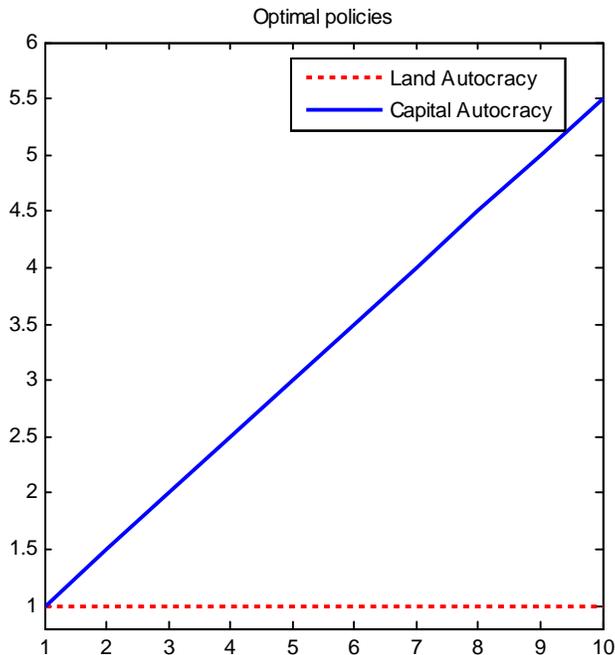


Figure 3: The optimal level of property rights in the two autocracies.

percent of their lifetime income to their children.

The population is normalised to one and we set the labour force,  $L$ , to .8. In each economy, the share of landowners,  $N_X$ , is set to .05.<sup>25</sup> The residual share of the population, i.e. the remaining 15 percent, constitute the capitalists,  $N_K$ , in each economy. Each worker is endowed with one unit of time and each landowner is endowed with one unit of land. The initial capital endowment,  $k_1$ , is set to .1.

In order to match actual historical events, we want to start from a situation where the land autocracy is open to trade while the capital autocracy is initially closed. To this end, we set the world relative price of agricultural goods,  $P_A^*$ , such that it is higher than the autarky relative price of agricultural goods that would prevail in any of the two economies.  $P_A^*$  is thus set to 1.5. The world market interest rate,  $r^*$ , is set to 3.

We think of property rights as a continuous variable, defined on the interval  $\pi_t = [\underline{\pi}, \bar{\pi}] \forall t$ . Both economies start out at the lower bound for property rights, i.e  $\pi_1^i = 1$  for  $i = K, X$ . We assume that policies are sluggish so that  $|\pi_t - \pi_{t-1}| \leq k$  where  $k$  is the maximum distance that property

<sup>25</sup> The size of the landed class is consistent with historical figures for Latin America, see Larsson and Parente (2010) for a discussion.

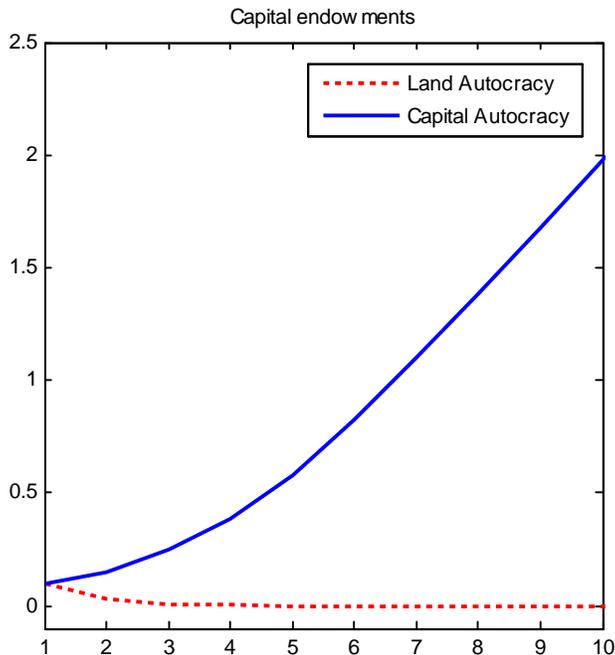


Figure 4: The evolution of capital endowments in the two regimes.

rights can be changed each period.

We assume that the inflow of foreign, more productive capital generates spillovers to domestic capital according to a linear function:  $A_K = \mu + \gamma K_F$ . We set  $\mu$  to one so that the relative productivity of capital is normalised to one in the absence of foreign capital. We have no prior for how to set  $\gamma$  but in the benchmark experiments discussed below we let  $\gamma = 10$ .

## 6.2 The Benchmark Model

Figure 3 illustrates the equilibrium property rights' regime implemented by the autocrat in each of the two economies. Recall that for this parameterisation, the land autocracy starts out open while the capital autocracy starts out closed to world trade. Consistent with Proposition 2, Figure 3 confirms that the autocrat in the land autocracy sets property rights at the lower bound in all periods while the autocrat in the capital autocracy keeps increasing property rights in each period.

To understand how the property rights regime affects the equilibrium outcome, we need to study the evolution of the capital endowment of a representative capitalist in each autocracy. Since the capitalists constitute the only population subgroup that affects the magnitude of the endowments

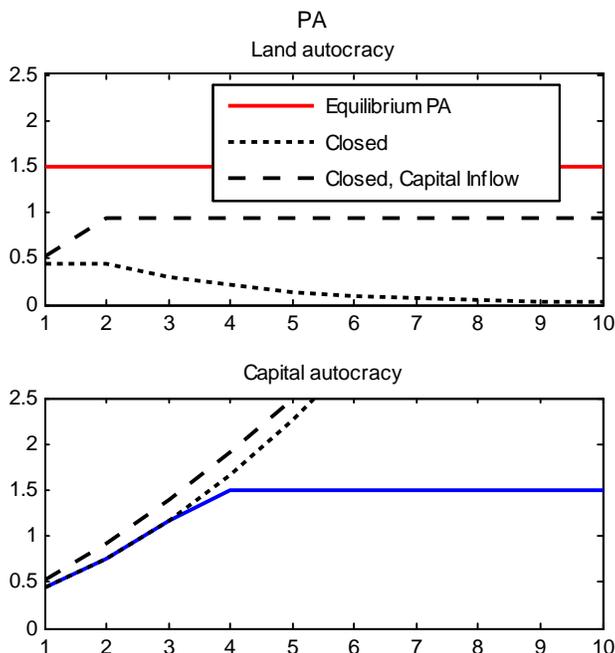


Figure 5: The equilibrium relative price and the (counterfactual) autarky price in the two autocracies.

of the next generation, the capitalists' endowments are key to understanding the overall equilibrium dynamics. Figure 4 displays the capital endowments implied by the implemented property rights regime in each economy. The graph illustrates how the reinforcement of property rights in the capital autocracy helps boost returns to domestic capital, the income of the capitalists, bequests and thereby the endowment of future generations. In the land autocracy, the weak property rights cause a rapid decline in returns to capital, capital income and bequests and lead to stagnation over the long term.

Turning to the decision to open up to trade in the capital autocracy, Figure 5 illustrates the equilibrium relative price,  $P_{At}$ , in the two autocracies, along with the counterfactual price that would prevail in autarky (with and without capital inflow). The top panel shows how in the land autocracy, the equilibrium price is the world market price in all periods as the economy remains open for the duration of the experiment. The figure suggests that, in the absence of foreign capital, the autarky price would decrease as a consequence of the declining capital stock. However, if the land autocracy were to close to trade but allow for capital inflow, the relative price of agriculture

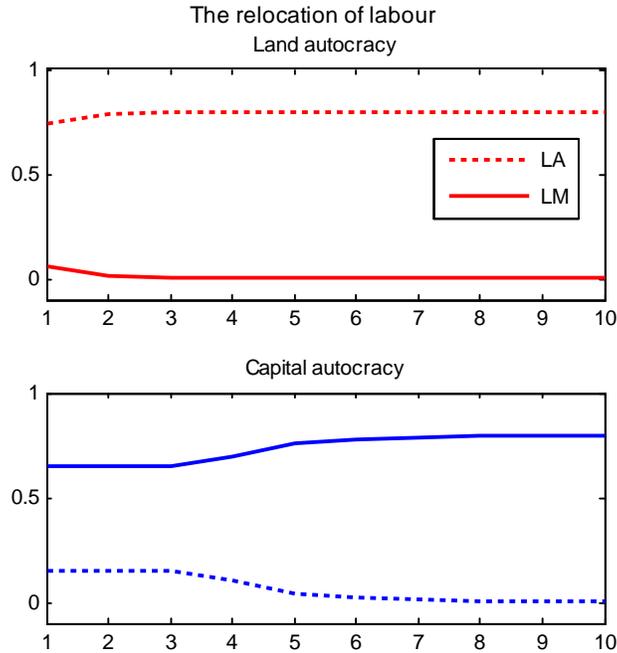


Figure 6: The relocation of labour in the two autocracies.

would increase somewhat initially, but never reach the price level prevailing in the world market. This graph thus illustrates how, due to the low property rights induced by the open regime and the small capital stock that follows, the landed autocrat will never choose to close his economy to trade.

The capital autocracy in the bottom panel starts out in a closed state, but due to the gradual strengthening of property rights that we saw in Figure 3, the capital stock will grow continuously as in Figure 4 and eventually cause the autarky price level to rise above the world market price level. Once the relative price of agricultural goods becomes higher in autarky than in the world market, the relative price of manufacturing goods by definition becomes higher in the world market than domestically. This implies that the capitalist elites, who hold the stakes in manufacturing production choose to open to trade at this point. The capital autocracy thus opens to trade in period 4 and we see that in Figure 5, the equilibrium price is given by the world market price from this period onwards.

Consistent with the evolution of capital and prices in the two economies, the allocation of labour between the two sectors is going to differ across the two autocracies. As displayed in the top panel

Table 1: Regime choices and the evolution of the capital stock.

$t$	1	2	3	4	5	6	7	8	9	10
Land autocracy										
$\pi$	1	1	1	1	1	1	1	1	1	1
$K_D$	.015	.004	.001	.000	.000	.000	.000	.000	.000	.000
$K_F$	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Trade	No									
F Capital	No									
Capital autocracy										
$\pi$	1	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
$K_D$	.015	.022	.037	.058	.086	.124	.165	.208	.251	.298
$K_F$	.000	.000	.000	.000	.000	.000	.000	.015	.013	.011
Trade	No	No	No	Yes						
F Capital	No	Yes	Yes	Yes						

in Figure 6, there is a slight increase in labour employed in agriculture mirrored by a decrease in labour employed in manufacturing in the land autocracy. This follows from the overall decrease in capital in the economy, in turn leading to stagnation in the production of manufactures. In the capital autocracy, the image is reversed. As long as the economy remains closed, through periods 1-3, the share of labour in each sector remains constant. However, when the economy opens up, the increasingly stronger property rights and the accumulation of capital leads to an inflow of workers from agriculture to manufacturing.<sup>26</sup>

We next address whether the two economies will liberalise capital markets and allow for an inflow of foreign capital. Table 1 displays the equilibrium property rights regime along with the equilibrium levels of domestic capital,  $K_D$ , the inflow of foreign capital,  $K_F$  and indications of whether the economies are open or closed and allow for capital inflow in each period. The results suggest that while the land autocracy remains open to trade throughout the experiment, the landed autocrat will never choose to allow for capital inflow. In the capital autocracy, however, the

<sup>26</sup> This feature of the model is consistent with Young (1995), who stresses how growth in the East Asian economies were spurred by rapid growth in investment rates and a large intersectoral transfer of labor into manufacturing.

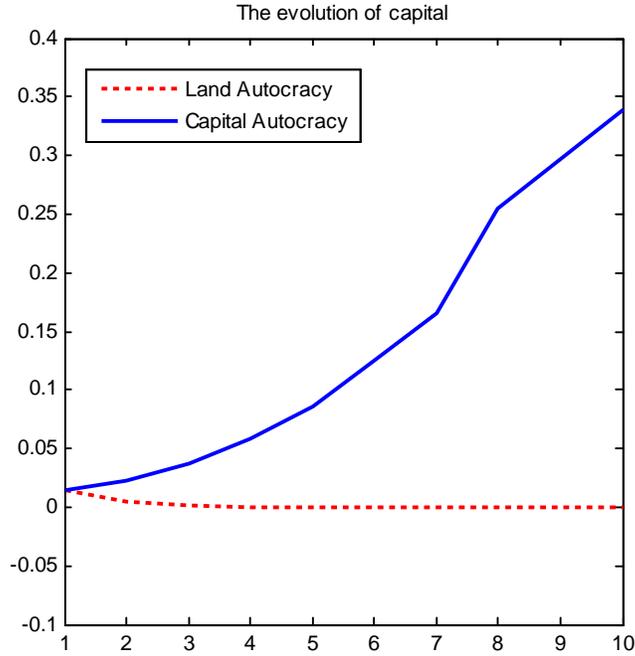


Figure 7: The evolution of effective (aggregate) capital in the two autocracies.

ruling autocrat allows for capital inflows once property rights are sufficiently strong, which for this parameterisation occurs in period 8.<sup>27</sup>

The evolution of the effective (aggregate) capital stocks, i.e.  $A_K K_D + K_F$ , in the two economies are plotted in Figure 7. Consistent with the declining capital endowments in Figure 4, the graph illustrates how the land autocracy stagnates over time. By contrast, spurred by the enforcement of strong property rights, the capital autocracy grows steadily over time. For the first seven periods, the plot of the capital stock looks somewhat convex. This is due to the initial growth being slightly lower than the capital growth that follows upon globalisation in period 4. Perhaps the most interesting feature of Figure 7, however, is the sharp increase in capital growth that follows once the autocrat allows for capital inflow. The entry of more productive, foreign capital boosts the efficiency of the aggregate capital stock. This acceleration in effective capital paves the way for growth and development in the capital autocracy.

<sup>27</sup> Since the interest rate parity condition implies that  $\tilde{r}_{Ft}^O \geq r_t^*$  must hold for investment to be attractive and since  $\tilde{r}_{Ft}^O$  is a decreasing function of domestic capital, foreign capital will only flow to the country if property rights grow sufficiently quickly relative to the decline in  $\tilde{r}_{Ft}^O$ . Moreover, spillovers from foreign capital need to be sufficiently large for the elite to allow for FDI.

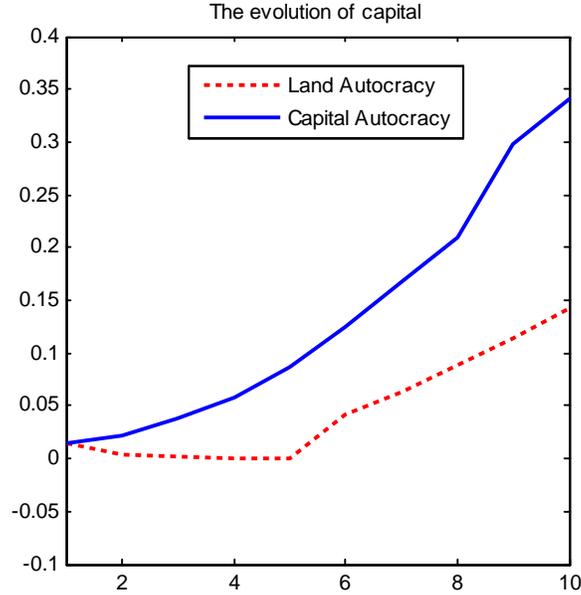


Figure 8: The evolution of effective (aggregate) capital in the two autocracies when the world market price drops from 1.5 to .25 in period 6.

### 6.3 The Effects of a Price Shock

To illustrate the effects of a price shock similar to that which hit Latin America after The Great Depression, we next study the case when the world-market price suddenly drops in period 6. The decrease in prices will imply that the landed autocrat will want to close the economy to trade. To this end, we assume that  $P_{At}^*$  is determined as follows:

$$P_{At}^* = \begin{cases} 1.5 & \forall t < 6 \\ .25 & \forall t \geq 6 \end{cases}$$

As before, the land autocracy starts out open, while the capital autocracy does not open to trade until it has accumulated sufficiently strong property rights, i.e. in period 4. When the price suddenly drops in period 6, the capital autocracy remains open and is unaffected by the price change. The autocrat in the land autocracy, however, decides to close the economy to trade when the world-market price falls. The reason is that the autarky price of agricultural goods starts to exceed the world-market price, implying that the landed elites are better off in a closed environment. Once the economy is closed, it is optimal for the autocrat to start enforcing property rights as this increases the relative price of agricultural goods. The gradual strengthening of property rights encourages capital accumulation and the inflow of more productive foreign capital. The evolution of effective

capital in the two autocracies is displayed in Figure 8. We see that while the capital stock in the capital autocracy remains intact, the world-market price drop in period 6 leads to a sharp increase in the capital stock in the land autocracy. Due to path-dependence, the land autocracy never catches up to the capital autocracy in terms of levels or growth rates, but the divergence between the two countries is much less pronounced.

## 7 Discussion

In this paper, we use a political economy approach to analyse a small open economy that starts out with a comparative disadvantage in manufacturing due to an initially small endowment of capital relative to the rest of the world. We want to study how an autocrat that caters to a political elite, endowed with either capital or land, values the enforcement of property rights, globalisation and the liberalisation of capital markets. We show how a stark contrast in the stance of the two types of autocrats on trade policy separates the development paths of the two regions.

A landed autocrat recognises the higher world market price of agricultural goods with respect to their autarky price and opens to trade. This increases the returns to domestic landowners and causes a shift of labour from the manufacturing to the agricultural sector. Since agricultural prices are fixed at the international level in an open economy, the productivity of land will solely be determined by the number of workers employed in the agricultural sector, which in turn governs the landed autocrat's policy towards property rights. Since the productivity of land is increasing in the number of workers per unit of land, the autocrat seeks to prevent a reallocation of workers to manufacturing by impeding the enhancement of institutions protecting property rights. Globalisation therefore fails to provide an environment that induces the autocrat to enforce property rights, and may thus be detrimental to capital accumulation and growth in a land autocracy.

Turning to the liberalisation of capital markets, the landed autocrat would lose from the inflow of foreign capital, since a larger capital stock will raise the productivity of workers employed in manufacturing and draw workers out of agriculture. Even if foreign capital were to be allowed into the country, weak institutional quality would deter foreign investors. Taken together, the policies implemented in the land autocracy decreases returns to domestic capital through three channels: (i) opening up to trade lowers the relative price of manufacturing goods; (ii) poor property rights lower the productivity of capital; and (iii) the inability to attract foreign capital fail to generate productivity spillovers that, if sufficiently strong, could increase the productivity of capital. These

low returns to capital decrease the incomes of capitalists and cause them to bequeath less, thereby hampering capital accumulation and development.

The land autocracy can therefore be characterised by early globalisation, weak property rights, little or no foreign investment and slow capital and income per capita growth. Although we do not explicitly address import substitution in the model, we use a numerical exercise to replicate the future impact of shocks that hit Latin America with a sharp exogenous decline in the terms of trade in 1929-1933 (Taylor, 1998). This exercise, discussed in detail in Section 6.3 above, illustrates how a shift to the import-competing activity that followed the resulting drop in trade volumes affected Latin America's ability to catch up with faster growing regions.

Conversely, the leader in the capital autocracy chooses to sustain a closed economy since the autarky price of manufacturing goods in a capital scarce country is higher than the world market price. In contrast to landlords, capital owners benefit from strong property rights because this increases the productivity of the factor they own. The capitalist autocrat therefore enforces property rights, which in turn increases the returns to capital in a closed economy. As income and bequests increase, capital accumulation accelerates. Capital owners are more likely to switch stance on trade if (i) property rights are strongly enforced (since this increases the marginal productivity of capital and lowers the autarky price of manufacturing goods); and (ii) if the domestic capital stock becomes sufficiently large (since this increases manufacturing output and lowers its autarky price). Thus when property rights become sufficiently strong and the economy accumulates enough capital, the capitalist autocrat opens up the economy.

If the capitalist autocrat were to maintain autarky, prices would continue to fall. However, in a trading economy, the fact that prices are fixed to the world price results in sustained high returns to capital and therefore larger bequests and faster capital growth. In such an economy, we show that trade in goods and factors are complements. This obtains since the strong property rights increase the rate of returns to capital in the domestic market, thereby attracting international investors. Strong property rights along with the productivity spillovers from foreign capital work as a catalyst for growth in the capital autocracy.<sup>28</sup>

---

<sup>28</sup> This feature of the model is consistent with Hsieh (2002), who shows how technological spillovers from the inflow of foreign capital can prevent a fall in the returns to capital and trigger further investment in the economy.

## 8 Concluding Remarks

In this paper we present a dynamic specific-factors model of an economy that may or may not choose to open up to trade. We use the model to explain key observations on the diverging growth performances of two regions with a long history of autocratic rule: East Asia and Latin America. We argue that the preferences of the ruling autocrat can have a crucial effect on the economy's development and growth prospects. We show that the incumbent autocrat, by deciding whether or not to enforce property rights, can set off a chain of events that have far-reaching implications in terms of long term growth and living standards.

Our model is consistent with a number of stylised facts that may help us understand the unprecedented success of East Asia and the mediocre performance of Latin America. The model suggests that the economies of Latin America were open to trade at an early stage of development due to their comparative advantage in agricultural products. Trade was endorsed by the landed political elite who owned the factor of production specific to the agricultural sector. However, in this open economy, policy makers had weak incentives to enforce strong property rights and the region failed to attract productive, foreign capital.

In East Asia, the political elite were more capitalist in nature. The East Asian autocrats were therefore reluctant to open up to trade initially, as they held a comparative disadvantage in manufacturing and wanted to wait until prices were lower than in world markets. In this state of autarky, however, the autocrats continued to comply with the demands of the elite and kept strengthening property rights within the country. Strengthened by sound property rights, the manufacturing industry grew domestically, and once the region had accumulated a comparative advantage in manufacturing it became optimal for policy makers to open up to trade. Moreover, the strong property rights led to the inflow of productive foreign capital that helped boost growth and development in the region.

Throughout the paper we model pure autocracies which implies that policy makers can implement whatever policies they choose in the absence of the accountability implied by a democratic system. However, our results would also obtain in a democracy where vested interest groups consisting of the political elites could tilt policy in their favour by lobbying their preferred policies.

The model can be extended in several interesting dimensions. One weakness of the model is admittedly the stylised way in which we model property rights. It would be interesting to study the foundations of property rights in greater detail and to add microfoundations for firms'

incentives to invest in new technology. This would, however, complicate the model significantly and would most likely require simplifications along some other dimension. Another interesting possibility would be to introduce a number of explicit trade policies and let the ruling autocrat set tariffs. In such a setting, import substitution could be incorporated in a realistic fashion which would allow us to address also this phase in Latin American history. Finally, historical experiences suggest that precautionary savings may have contributed to high saving in East Asia. The idea here is that East Asia's history of wars and unrest have led its citizens to save in a precautionary manner. Incorporating such cultural differences in a dynamic model of growth and development could therefore also prove an interesting avenue for future research.

## References

- [1] Acemoglu, D. and Robinson, J.A. (2000), "Political Losers as a Barrier to Economic Development," *American Economic Review*, American Economic Association, vol. 90 (2), pp. 126-130, May
- [2] Acemoglu, D. and Robinson, J.A. (2001), "A Theory of Political Transitions", *American Economic Review*, 91 (4), pp. 938-963
- [3] Acemoglu, D. and Robinson, J.A. (2006), *Economic Origins of Dictatorship and Democracy*, Cambridge: Cambridge University Press.
- [4] Acemoglu, D. and Robinson, J.A. (2007), "Persistence of Power, Elites and Institutions", *American Economic Review*, 98 (1), pp. 267-93.
- [5] Acemoglu, D., Johnson, S., Robinson, J.A. and Yared, P. (2008), "Income and Democracy", *American Economic Review*, 98 (3), pp. 808-842.
- [6] Adamopoulos, T. (2008), "Land Inequality and the Transition to Modern Growth", *Review of Economic Dynamics*, 11, pp. 257-282.
- [7] Aghion, P., Alesina, A. and Trebbi, F. (2007), "Democracy, Technology and Growth", Harvard Institute of Economic Research Discussion Paper No. 2138, Harvard University.
- [8] Albornoz, F., Galiani, S. and Heymann, D. (2008), "Investment and Expropriation under Oligarchy and Democracy in a Heckscher-Ohlin World", University of Birmingham Working Paper.
- [9] Anderson, K. (1983), "Economic Growth, Comparative Advantage and Agricultural Trade of Pacific Rim Countries", *Review of Marketing and Agricultural Economics*, 51 (3), pp. 231-248.
- [10] Antras, P. and Caballero, R.J. (2009), "Trade and Capital Flows: A Financial Frictions Perspective", *Journal of Political Economy*, 117, pp. 701-743.
- [11] Cervelatti, M., Naghavi, A. and Toubal, F. (2011), "On the Complementarity Between Trade and Democracy for Technology Adoption", mimeo, Department of Economics, University of Bologna.

- [12] Falkinger, J. and Grossman, V. (2005), "Institutions and Development: The Interaction between Trade Regime and Political System", *Journal of Economic Growth*, 10, pp. 231-272
- [13] Galiani, S., Heymann, D., Dabus, C. and Tohme, F. (2008), "On the Emergence of Public Education in Land-rich Economies", *Journal of Development Economics*, 86, pp. 434-446.
- [14] Galor, O. and Moav, O. (2006), "Das Human-Kapital: A Theory of the Demise of the Class Structure", *Review of Economic Studies*, 73, pp. 85-117.
- [15] Galor, O., Moav, O. and Vollrath, D. (2009), "Inequality in Landownership, the Emergence of Human-Capital Promoting Institutions, and the Great Divergence", *Review of Economic Studies*, Vol. 76 (1), pp. 143-179.
- [16] Glaeser, E.L., La Porta R., Lopez-de-Silanes F., and Shleifer A. (2004), "Do Institutions Cause Growth?", *Journal of Economic Growth*, 9, pp. 271-303.
- [17] Hsieh, C.T. (2002), "What Explains the Industrial Revolution in East Asia? Evidence from the Factor Markets", *American Economic Review*, 92 (3), pp. 502-526.
- [18] Jones, R.W. (1971), "A three-factor model in theory, trade and history", In Bhagwati, J. et al., eds., *Trade, Balance of Payments and Growth*, Amsterdam: North-Holland.
- [19] Jones, R.W. and Neary, J.P. (1984), "The Positive Theory of International Trade", In *Handbook of International Economics, Volume 1*, ed. R.W. Jones and P.B. Kenen, Amsterdam: North-Holland.
- [20] Krueger, Anne O. (1985), "The Experience and Lessons of Asia's Super Exporters", in V. Corbo et al. (Eds.), *Export-Oriented Development Strategies: The Success of Five Newly Industrializing Countries*, Boulder and London: Westview Press.
- [21] Larsson, A. and Parente, S.L. (2010), "Democracy as a Middle Ground: A Unified Theory of Development and Political Regimes", *Research Papers in Economics 2010:7*, Department of Economics, Stockholm University.
- [22] Markusen, J.R. (1983), "Factor Movements and Commodity Trade as Complements", *Journal of International Economics*, 19, pp. 341-356
- [23] Markusen, J.R. and Svensson, L.E.O (1985), "Trade in Goods and Factors with International Differences in Technology", *International Economic Review*, 26, pp. 175-192.

- [24] Mussa, M. (1974), "Tariffs and the distribution of income: the importance of factor specificity, substitutability and intensity in the short and long run", *Journal of Political Economy*, 82, pp. 1191-1203
- [25] Neary, J. P. (1978), "Short-run capital specificity and the pure theory of international trade", *Economic Journal*, 88, pp. 458-510.
- [26] Neary, J. P. (1995), "Factor Mobility and International Trade", *Canadian Journal of Economics*, 28, pp. 4-23.
- [27] Nelson, R.R. and Pack, H. (1999), "The Asian Miracle and Modern Growth Theory", *Economic Journal*, 109, pp. 416-436.
- [28] Paltseva, E. (2008), "Autocracy, Devolution and Growth", mimeo, University of Copenhagen.
- [29] Parente, S.L. and Prescott, E.C. (2002), *Barriers to Riches*, MIT Press
- [30] Persson, T. and Tabellini, G. (1994), "Is Inequality Harmful for Growth?," *American Economic Review*, Vol. 84 (3), pp. 600-621
- [31] Persson, T. and Tabellini, G. (2002), *Political Economics: Explaining Economic Policy*, MIT Press, Cambridge, MA
- [32] Persson, T. and Tabellini, G. (2009), "Democratic Capital: The Nexus of Political and Economic Change," *American Economic Journal: Macroeconomics*, Vol. 1(2), pp. 88-126
- [33] Rodrik, D. (1994), "Getting Interventions Right: How South Korea and Taiwan Grew Rich", NBER Working Paper No. 4964
- [34] Rodrik, D. (1996), "Coordination Failures and Government policy: A Model with Applications to East Asia and Eastern Europe", *Journal of International Economics*, 40, pp. 1-22.
- [35] Samuelson, P.A. (1971), "Ohlin Was Right", *Swedish Journal of Economics*, 73, pp. 365-384.
- [36] Shen, L. (2007), "When will a Dictator be Good?", *Economic Theory* Vol. 31, No. 2, pp. 343-366
- [37] Sokoloff, K.L and Engerman, S.L (2000), "Institutions, factor endowments, and paths of development in the New World", *Journal of Economic Perspectives*, 14 (3), pp. 217-232.

- [38] Stiglitz, J. (1996), "Some Lessons from the East Asian Miracle", *The World Bank Research Observer*, Vol. 11, no. 2, pp. 151-177
- [39] Taylor, A.M. (1998), "On the Costs of Inward-Looking Development: Price Distortions, Growth, and Divergence in Latin America", *The Journal of Economic History*, 58 (1), pp. 1-28.
- [40] Werner, B. (1972), "Import Substitution and Industrialization in Latin America: Experiences and Interpretations", *Latin American Research Review*, 7 (1), pp. 95-122.
- [41] Wong, K. (1986), "Are International Trade and Factor Mobility Substitutes?" *Journal of International Economics*, 21, pp. 25-44.
- [42] World Bank (1993), *The East Asian Miracle: Economic Growth and Public Policy*, Oxford University Press for the World Bank, Washington, DC.
- [43] Young, A. (1995), "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience", *Quarterly Journal of Economics*, 100 (3), pp. 641-680

## NOTE DI LAVORO DELLA FONDAZIONE ENI ENRICO MATTEI

### Fondazione Eni Enrico Mattei Working Paper Series

Our Note di Lavoro are available on the Internet at the following addresses:

<http://www.feem.it/getpage.aspx?id=73&sez=Publications&padre=20&tab=1>  
[http://papers.ssrn.com/sol3/JELJOUR\\_Results.cfm?form\\_name=journalbrowse&journal\\_id=266659](http://papers.ssrn.com/sol3/JELJOUR_Results.cfm?form_name=journalbrowse&journal_id=266659)  
<http://ideas.repec.org/s/fem/femwpa.html>  
<http://www.econis.eu/LNG=EN/FAM?PPN=505954494>  
<http://ageconsearch.umn.edu/handle/35978>  
<http://www.bepress.com/feem/>

### NOTE DI LAVORO PUBLISHED IN 2011

SD	1.2011	Anna Alberini, Will Gans and Daniel Velez-Lopez: <a href="#">Residential Consumption of Gas and Electricity in the U.S.: The Role of Prices and Income</a>
SD	2.2011	Alexander Golub, Daiju Narita and Matthias G.W. Schmidt: <a href="#">Uncertainty in Integrated Assessment Models of Climate Change: Alternative Analytical Approaches</a>
SD	3.2010	Reyer Gerlagh and Nicole A. Mathys: <a href="#">Energy Abundance, Trade and Industry Location</a>
SD	4.2010	Melania Michetti and Renato Nunes Rosa: <a href="#">Afforestation and Timber Management Compliance Strategies in Climate Policy. A Computable General Equilibrium Analysis</a>
SD	5.2011	Hassan Benchekroun and Amrita Ray Chaudhuri: <a href="#">“The Voracity Effect” and Climate Change: The Impact of Clean Technologies</a>
IM	6.2011	Sergio Mariotti, Marco Mutinelli, Marcella Nicolini and Lucia Piscitello: <a href="#">Productivity Spillovers from Foreign MNEs on Domestic Manufacturing Firms: Is Co-location Always a Plus?</a>
GC	7.2011	Marco Percoco: <a href="#">The Fight Against Geography: Malaria and Economic Development in Italian Regions</a>
GC	8.2011	Bin Dong and Benno Torgler: <a href="#">Democracy, Property Rights, Income Equality, and Corruption</a>
GC	9.2011	Bin Dong and Benno Torgler: <a href="#">Corruption and Social Interaction: Evidence from China</a>
SD	10.2011	Elisa Lanzi, Elena Verdolini and Ivan Haščič: <a href="#">Efficiency Improving Fossil Fuel Technologies for Electricity Generation: Data Selection and Trends</a>
SD	11.2011	Stergios Athanassoglou: <a href="#">Efficient Random Assignment under a Combination of Ordinal and Cardinal Information on Preferences</a>
SD	12.2011	Robin Cross, Andrew J. Plantinga and Robert N. Stavins: <a href="#">The Value of Terroir: Hedonic Estimation of Vineyard Sale Prices</a>
SD	13.2011	Charles F. Mason and Andrew J. Plantinga: <a href="#">Contracting for Impure Public Goods: Carbon Offsets and Additionality</a>
SD	14.2011	Alain Ayong Le Kama, Aude Pommeret and Fabien Prieur: <a href="#">Optimal Emission Policy under the Risk of Irreversible Pollution</a>
SD	15.2011	Philippe Quirion, Julie Rozenberg, Olivier Sassi and Adrien Vogt-Schilb: <a href="#">How CO2 Capture and Storage Can Mitigate Carbon Leakage</a>
SD	16.2011	Carlo Carraro and Emanuele Massetti: <a href="#">Energy and Climate Change in China</a>
SD	17.2011	ZhongXiang Zhang: <a href="#">Effective Environmental Protection in the Context of Government Decentralization</a>
SD	18.2011	Stergios Athanassoglou and Anastasios Xepapadeas: <a href="#">Pollution Control with Uncertain Stock Dynamics: When, and How, to be Precautious</a>
SD	19.2011	Jūratė Jaraitė and Corrado Di Maria: <a href="#">Efficiency, Productivity and Environmental Policy: A Case Study of Power Generation in the EU</a>
SD	20.2011	Giulio Cainelli, Massimiliano Mozzanti and Sandro Montresor: <a href="#">Environmental Innovations, Local Networks and Internationalization</a>
SD	21.2011	Gérard Mondello: <a href="#">Hazardous Activities and Civil Strict Liability: The Regulator’s Dilemma</a>
SD	22.2011	Haiyan Xu and ZhongXiang Zhang: <a href="#">A Trend Deduction Model of Fluctuating Oil Prices</a>
SD	23.2011	Athanasios Lapatinas, Anastasia Litina and Eftichios S. Sartzetakis: <a href="#">Corruption and Environmental Policy: An Alternative Perspective</a>
SD	24.2011	Emanuele Massetti: <a href="#">A Tale of Two Countries: Emissions Scenarios for China and India</a>
SD	25.2011	Xavier Pautrel: <a href="#">Abatement Technology and the Environment-Growth Nexus with Education</a>
SD	26.2011	Dionysis Latinopoulos and Eftichios Sartzetakis: <a href="#">Optimal Exploitation of Groundwater and the Potential for a Tradable Permit System in Irrigated Agriculture</a>
SD	27.2011	Benno Torgler and Marco Piatti: <a href="#">A Century of American Economic Review</a>
SD	28.2011	Stergios Athanassoglou, Glenn Sheriff, Tobias Siegfried and Woonghee Tim Huh: <a href="#">Optimal Mechanisms for Heterogeneous Multi-cell Aquifers</a>
SD	29.2011	Libo Wu, Jing Li and ZhongXiang Zhang: <a href="#">Inflationary Effect of Oil-Price Shocks in an Imperfect Market: A Partial Transmission Input-output Analysis</a>
SD	30.2011	Junko Mochizuki and ZhongXiang Zhang: <a href="#">Environmental Security and its Implications for China’s Foreign Relations</a>
SD	31.2011	Teng Fei, He Jiankun, Pan Xunzhang and Zhang Chi: <a href="#">How to Measure Carbon Equity: Carbon Gini Index Based on Historical Cumulative Emission Per Capita</a>
SD	32.2011	Dirk Rübbelke and Pia Weiss: <a href="#">Environmental Regulations, Market Structure and Technological Progress in Renewable Energy Technology – A Panel Data Study on Wind Turbines</a>

SD	33.2011	Nicola Doni and Giorgio Ricchiuti: <a href="#">Market Equilibrium in the Presence of Green Consumers and Responsible Firms: a Comparative Statics Analysis</a>
SD	34.2011	Gérard Mondello: <a href="#">Civil Liability, Safety and Nuclear Parks: Is Concentrated Management Better?</a>
SD	35.2011	Walid Marrouch and Amrita Ray Chaudhuri: <a href="#">International Environmental Agreements in the Presence of Adaptation</a>
ERM	36.2011	Will Gans, Anna Alberini and Alberto Longo: <a href="#">Smart Meter Devices and The Effect of Feedback on Residential Electricity Consumption: Evidence from a Natural Experiment in Northern Ireland</a>
ERM	37.2011	William K. Jaeger and Thorsten M. Egelkraut: <a href="#">Biofuel Economics in a Setting of Multiple Objectives &amp; Unintended Consequences</a>
CCSD	38.2011	Kyriaki Remoundou, Fikret Adaman, Phoebe Koundouri and Paulo A.L.D. Nunes: <a href="#">Are Preferences for Environmental Quality Sensitive to Financial Funding Schemes? Evidence from a Marine Restoration Programme in the Black Sea</a>
CCSD	39.2011	Andrea Ghermanti and Paulo A.L.D. Nunes: <a href="#">A Global Map of Costal Recreation Values: Results From a Spatially Explicit Based Meta-Analysis</a>
CCSD	40.2011	Andries Richter, Anne Maria Eikeset, Daan van Soest, and Nils Chr. Stenseth: <a href="#">Towards the Optimal Management of the Northeast Arctic Cod Fishery</a>
CCSD	41.2011	Florian M. Biermann: <a href="#">A Measure to Compare Matchings in Marriage Markets</a>
CCSD	42.2011	Timo Hiller: <a href="#">Alliance Formation and Coercion in Networks</a>
CCSD	43.2011	Sunghoon Hong: <a href="#">Strategic Network Interdiction</a>
CCSD	44.2011	Arnold Polanski and Emiliya A. Lazarova: <a href="#">Dynamic Multilateral Markets</a>
CCSD	45.2011	Marco Mantovani, Georg Kirchsteiger, Ana Mauleon and Vincent Vannetelbosch: <a href="#">Myopic or Farsighted? An Experiment on Network Formation</a>
CCSD	46.2011	Rémy Oddou: <a href="#">The Effect of Spillovers and Congestion on the Segregative Properties of Endogenous Jurisdiction Structure Formation</a>
CCSD	47.2011	Emanuele Massetti and Elena Claire Ricci: <a href="#">Super-Grids and Concentrated Solar Power: A Scenario Analysis with the WITCH Model</a>
ERM	48.2011	Matthias Kalkuhl, Ottmar Edenhofer and Kai Lessmann: <a href="#">Renewable Energy Subsidies: Second-Best Policy or Fatal Aberration for Mitigation?</a>
CCSD	49.2011	ZhongXiang Zhang: <a href="#">Breaking the Impasse in International Climate Negotiations: A New Direction for Currently Flawed Negotiations and a Roadmap for China to 2050</a>
CCSD	50.2011	Emanuele Massetti and Robert Mendelsohn: <a href="#">Estimating Ricardian Models With Panel Data</a>
CCSD	51.2011	Y. Hossein Farzin and Kelly A. Grogan: <a href="#">Socioeconomic Factors and Water Quality in California</a>
CCSD	52.2011	Dinko Dimitrov and Shao Chin Sung: <a href="#">Size Monotonicity and Stability of the Core in Hedonic Games</a>
ES	53.2011	Giovanni Mastrobuoni and Paolo Pinotti: <a href="#">Migration Restrictions and Criminal Behavior: Evidence from a Natural Experiment</a>
ERM	54.2011	Alessandro Cologni and Matteo Manera: <a href="#">On the Economic Determinants of Oil Production. Theoretical Analysis and Empirical Evidence for Small Exporting Countries</a>
ERM	55.2011	Alessandro Cologni and Matteo Manera: <a href="#">Exogenous Oil Shocks, Fiscal Policy and Sector Reallocations in Oil Producing Countries</a>
ERM	56.2011	Morgan Bazilian, Patrick Nussbaumer, Giorgio Gualberti, Erik Haites, Michael Levi, Judy Siegel, Daniel M. Kammen and Joergen Fenhann: <a href="#">Informing the Financing of Universal Energy Access: An Assessment of Current Flows</a>
CCSD	57.2011	Carlo Orecchia and Maria Elisabetta Tessitore: <a href="#">Economic Growth and the Environment with Clean and Dirty Consumption</a>
ERM	58.2011	Wan-Jung Chou, Andrea Bigano, Alistair Hunt, Stephane La Branche, Anil Markandya and Roberta Pierfederici: <a href="#">Households' WTP for the Reliability of Gas Supply</a>
ES	59.2011	Maria Comune, Alireza Naghavi and Giovanni Prarolo: <a href="#">Intellectual Property Rights and South-North Formation of Global Innovation Networks</a>
ES	60.2011	Alireza Naghavi and Chiara Strozzi: <a href="#">Intellectual Property Rights, Migration, and Diaspora</a>
CCSD	61.2011	Massimo Tavoni, Shoibal Chakravarty and Robert Socolow: <a href="#">Safe vs. Fair: A Formidable Trade-off in Tackling Climate Change</a>
CCSD	62.2011	Donatella Baiardi, Matteo Manera and Mario Menegatti: <a href="#">Consumption and Precautionary Saving: An Empirical Analysis under Both Financial and Environmental Risks</a>
ERM	63.2011	Caterina Gennaioli and Massimo Tavoni: <a href="#">Clean or "Dirty" Energy: Evidence on a Renewable Energy Resource Curse</a>
ES	64.2011	Angelo Antoci and Luca Zarri: <a href="#">Punish and Perish?</a>
ES	65.2011	Anders Akerman, Anna Larsson and Alireza Naghavi: <a href="#">Autocracies and Development in a Global Economy: A Tale of Two Elites</a>