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

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Alma Mater Studiorum - Università di Bologna  
DEPARTMENT OF ECONOMICS

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

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

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## Abstract

This paper studies how comparative advantage and the political elites' endowments shape long-run performance in an economy with imperfect political institutions. In a capital-scarce economy, an autocrat catering to the needs of landowners favours openness to trade at an early stage of development, while an autocrat complying with the preferences of capitalists chooses to shelter the economy from trade. The trade regime interacts with economic institutions, and with policies on capital mobility, to govern capital accumulation. A landed autocrat neglects to improve institutions and blocks foreign capital to maximize extractable rents, leading the economy towards stagnation. By contrast, a capitalist autocrat strengthens institutions, which promotes manufacturing TFP growth, gradually shifts the comparative advantage towards manufacturing and renders the economy attractive to foreign investors. Allowing for trade and foreign capital inflows are thus complementary policies that provide an environment of growth and development in the capital autocracy.

*JEL-Classification: F10; F20; P40; P50; O10; O24.*

*Keywords: political institutions; development; economic institutions; trade; comparative advantage; capital mobility; capital accumulation.*

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# 1 Introduction

Data from the post World-War II era of globalization reveal a striking variation in the growth performance of autocratic countries: dictatorships tend to either excel or fall behind. Openness to trade appears to have been conducive to growth in some autocracies but not in others. At the lower end of the spectrum of autocracies are some of the world's poorest performing economies and at the upper end are the miraculous East Asian Tiger Economies who have doubled their income in a decade or less since the beginning of the 1960s. How can we explain these differences in performance?

In this paper we highlight an empirical feature that has been somewhat overlooked in the existing literature: the fact that the endowments of the political elites, and therefore the preferences of the ruling autocrats, differ across countries. We model an economy with imperfect political institutions and study how the trade regime interacts with policies affecting the institutional quality and international capital mobility.<sup>1</sup> We argue that the interplay between these elements is crucial for growth and development.

A growing strand of literature emphasizes how political and economic institutions shape long-run performance and helps us understand some of the reasons autocracies differ, see for instance Acemoglu, Johnson and Robinson (2005a) and Acemoglu and Robinson (2006) for overviews.<sup>2</sup> The relationship between openness and institutions has become subject to intensive research only in recent years and the empirical results are mixed. Free trade can either lead to stronger institutions as in Ades and Di Tella (1999), Acemoglu, Johnson and Robinson (2005b), Rodrik, Subramanian and Trebbi (2004) and Rigobon and Rodrik (2005), or to institutional deterioration as in Treisman (2003) and Tavares (2007). As argued by Stefanadis (2010), the empirical literature is ahead of theory in this area and more theoretical work is needed to deepen our understanding of the interaction between globalization and institutional quality.

While proponents of trade argue that economic integration is conducive to stronger institutions, a series of recent papers point out that this is not always the case. Johnson, Ostry, and Subramanian (2007) suggest that if returns from trade fall into the hands of a small elite, the concentration of power that may follow can worsen institutions. Bardhan (2010) confirms that the trade expansion

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<sup>1</sup> The notion that trade in goods and capital movements interact with each other, and can be either complements or substitutes, is the subject of a large literature comprising Markusen (1983), Jones and Neary (1984), Markusen and Svensson (1985), Wong (1986), Jones (1989), and Neary (1995).

<sup>2</sup> Within this literature, examples of imperfect political institutions include expropriation (Segura-Cayuela, 2006; Stefanadis, 2010), inequality in land ownership (Galor, Moav and Vollrath, 2009; Falkinger and Grossman, 2013) and rent-seeking (Levchenko, 2007; Cervellati, Naghavi and Toubal, 2013).

in natural resource intensive products has strengthened the political power of large exporters who subsequently have raised barriers to entry and promoted oligarchic institutions. Levchenko (2012) adds that trade improves the institutional quality if it reduces the rents from dysfunctional institutions, but brings institutional deterioration in the opposite case. Several recent theoretical papers have demonstrated the negative effect of autocracies opening to trade on domestic economic institutions such as investment in schooling (Falkinger and Grossman, 2005), the investment climate (Do and Levchenko, 2009), property rights (Stefanadis, 2010), and technology adoption (Cervellati, Naghavi and Toubal, 2013). We contribute to this literature by arguing that the effects of trade on institutional quality are contingent on the nature of the political elites.

Consistent with the aforementioned literature, we show that if the political elites are landowners in a capital-scarce economy, openness to trade creates an environment of institutional neglect and stagnation. However, if the political elites are instead capitalists, the autocrat gradually shifts the comparative advantage towards manufacturing by improving the institutional quality, which eventually provides an incentive to open up to trade and allow for foreign capital inflows. We also add to the existing literature by stressing that the complementarity of policies on trade and capital mobility is crucial for the success of autocratic economies and show that such complementarities arise in the capitalist autocracy.

We build a specific-factor trade model where the nature of the political elites and the comparative advantage determine the long-term development of an economy with imperfect political institutions.<sup>3</sup> The economy consists of an agricultural sector and a manufacturing sector. The political elites may hold either land or capital and we shall henceforth refer to these economies as land and capital autocracies, respectively. The autocrat's policy space comprises the following elements: (i) the ability to allow for international trade in goods; (ii) the ability to strengthen economic institutions that promote manufacturing TFP growth; and (iii) the ability to allow for the inflow of foreign capital.

We consider a setting where each economy is characterized by an initial comparative disadvantage in manufacturing and show that the two different types of autocracies react differently to globalization. A landed autocrat prefers to open up to trade at an early stage of development, which creates an environment where institutional quality is neglected. This prediction is consistent with developments in Argentina after the Perónist populist and protectionist era, where the mili-

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<sup>3</sup> For seminal contributions to the class of specific-factor models see Jones (1971), Samuelson (1971), Mussa (1974) and Neary (1978).

tary government, mainly controlled by the agricultural elites, took power in 1976 and brought the economy back to free trade (Brambilla, Galiani, and Porto, 2010).

By contrast, a capitalist autocrat initially shelters the economy from global markets while promoting institutional quality. Rodrik (1994) stresses that an important factor behind the outstanding performances of South Korea and Taiwan was indeed that governments managed to raise the returns to private investments, thereby increasing the demand for imported capital goods. In line with this argument, we show that the endowments of the political elites govern whether openness to trade and to foreign capital inflows are complementary policies. This is the case in a capitalist autocracy so that the benefits of allowing for foreign capital inflows are realized only once the economy is open to trade. This result is consistent with actual developments in some of the growth-miracle economies, such as Taiwan and South Korea, where the entrepreneurial elites allowed for large-scale capital inflows only after opening up to trade in the 1970's.<sup>4</sup> In an autocracy where the elites are landowners, no such complementarities exist.

The rest of the paper is organized as follows. Section 2 presents the model. Section 3 discusses the equilibrium under different trade regimes. Section 4 introduces international capital mobility. Section 5 presents the political-economy layer of the model and derives analytical results on optimal policies. The results from a numerical simulation of the model are presented in Section 6. The results are related to actual historical accounts in Section 7. Section 8 concludes.

## 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. Owners of the factors of production have warm-glow preferences and leave bequests to their offspring.<sup>5</sup>

We vary the assumption on the nature of the political elites and assume that they are either landowners or capitalists. The autocrat caters to the needs of the elites and may thus be either

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<sup>4</sup> Source: *Statistics on Approved Overseas Chinese and Foreign Investment by Area*, the Investment Commission, Ministry of Economic Affairs, Taiwan.

<sup>5</sup> The warm-glow preference structure enables us to characterize 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.

landed or capitalist in nature.<sup>6</sup> The autocrat governs the institutional quality and makes decisions on whether or not to allow for international trade in goods and foreign capital inflows.

We first treat institutions and regimes as exogenously given and focus on solving the economic model in Sections 2-4. Since we are ultimately interested in how the elites choose policies, we put particular emphasis on the real returns to capital and land under different regimes in these Sections. The preferences and optimal choices of the ruling autocrats are then analysed in Section 5.

## 2.1 Production

The agricultural 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 so that the labour supply is infinitely elastic.

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

$$Y_{At} = X_t^\alpha L_{At}^{1-\alpha} \quad (1)$$

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

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

$$Y_{Mt} = A_{Mt} K_t^\alpha L_{Mt}^{1-\alpha} \quad (2)$$

where  $A_{Mt}$  denotes total factor productivity in the manufacturing sector and  $L_{Mt}$  refers to the labour employed in the sector.<sup>7</sup>  $K_t = A_{Kt} K_{Dt} + K_{Ft}$  is the total effective capital stock in the economy and comprises domestic and foreign capital,  $K_{Dt}$  and  $K_{Ft}$ , respectively. A key feature of the model is an assumption that domestic capital is less productive than foreign capital and we let the parameter  $A_{Kt}$  denote the relative productivity of domestic capital. At a later stage, we will model  $A_{Kt}$  as a function of  $K_{Ft}$ , thereby assuming that the presence of foreign, more productive capital will have positive spill-over effects on domestic capital. In equilibrium the presence of such capital will hinge on domestic returns to capital being sufficiently high as well as the incumbent autocrat allowing for such capital inflows. For now, however, we treat  $A_{Kt}$  as a parameter, derive equilibrium expressions that hold for  $K_{Ft} \geq 0$ , and return to this issue in Section 4.

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<sup>6</sup> The possibility that autocrats may be heterogeneous and have different objectives is also present in Shen (2007), Paltseva (2008) and Larsson Seim and Parente (2012). However, these papers do not take into account that the endowments of the political elites may be country-specific.

<sup>7</sup> We assume labour intensity,  $1 - \alpha$ , to be 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.

While total factor productivity is assumed to be constant and normalized to one in the agricultural sector, TFP in the manufacturing sector grows at some exogenous rate  $\gamma_t > 0$ . However, the evolution of manufacturing TFP is also governed by policy. Specifically,  $A_{Mt}$  evolves according to:

$$A_{Mt} = (1 + \pi_{Mt}\gamma_t)A_{Mt-1} \quad (3)$$

where  $\pi_{Mt} \in [0, 1]$  is a policy variable. The construct allows us to think of  $\pi_{Mt}$  as a broad measure of the quality of institutions capturing the extent to which policy makers seek to promote technological progress. In an environment with extremely strong institutions, i.e. where policies are conducive to technology adoption,  $\pi_{Mt} = 1$  so that manufacturing TFP grows at its full potential. Conversely, in an economy with extremely weak institutions, i.e. where the policy maker seeks to completely block the adoption of new technologies,  $\pi_{Mt} = 0$  so that there is no technological progress and manufacturing TFP stagnates.

## 2.2 Endowments, Preferences and Income

The population consists of capitalists, indexed  $K$ , landowners, indexed  $X$ , and workers, indexed  $L$ . Letting  $N_K, N_X$  and  $L$  denote the measure of each group, the total population at time  $t$  is  $N_t = N_{Kt} + N_{Xt} + L_t$ . We assume a stationary population normalized to one, as population growth is of no importance for the dynamics of interest in our setting. Landowners hold one unit of land which they rent to firms in the agricultural sector, while capitalists rent their capital to firms in the manufacturing sector.

Owners of the factors of production derive utility from consumption and from leaving bequests to their children and the utility function assumes the following form:

$$U(C_t, B_{ht}) = C_t^\mu B_{ht}^{1-\mu}$$

for  $h = K, X$  where  $C_t = C_{At}^\sigma C_{Mt}^{1-\sigma}$  and the maximization is subject to constraints that are household-specific. The elite households leave bequests according to their endowments. Land and capital differ in that land does not depreciate while capital depreciates fully from one generation to another. This means that landowners simply bequeath their land endowments to their children while capitalists convert a share of their income to bequests in terms of an investment good. Bequests are thus a part of the budget restriction of the capitalists but not of the landowners. The details of the households' maximization problems are given in Appendix A1.

The income of a domestic capitalist is:

$$I_{Kt} = i_{Dt}k_t, \quad (4)$$



where  $i_{Dt}$  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:

$$I_{Xt} = i_{Xt}, \quad (5)$$

where  $i_{Xt}$  denotes returns to land. Finally, workers' income amounts to their wages:

$$I_{Ljt} = w_{jt}, \quad (6)$$

where  $j = A, M$  represents the sector of employment.

We let  $P_{At}$ ,  $P_{Mt}$  and  $P_{Bt}$  denote the prices of agricultural goods, manufacturing goods and bequests, respectively. For simplicity, we assume that bequests are made in terms of manufacturing goods, which implies  $P_{Bt} = P_{Mt}$ . We treat the manufacturing sector as the numéraire sector and set  $P_{Mt}$  to unity.  $P_{At}$  therefore denotes the relative price of agricultural goods in terms of manufacturing goods.

Under these assumptions, the indirect utility functions of the elite households are:

$$V_{Kt} = \lambda_K \frac{I_{Kt}}{P_{At}^{\mu\sigma}}, \quad (7)$$

$$V_{Xt} = \lambda_X \frac{I_{Xt}}{P_{At}^{\sigma}}, \quad (8)$$

where  $\lambda_K \equiv (\mu\sigma)^{\mu\sigma} (\mu(1-\sigma))^{\mu(1-\sigma)} (1-\mu)^{(1-\mu)}$  and  $\lambda_X \equiv \sigma^\sigma (1-\sigma)^{(1-\sigma)}$ .

Since workers do not own any resources other than time, they leave no bequests but consume their entire income. They thus choose consumption baskets in the same way as the landowners.

Finally, we note that defining the general price level as the nominal income needed to buy one unit of the optimal basket of consumption and bequests, the price indices facing each group are  $P_{Kt} = P_{At}^{\mu\sigma}$  and  $P_{Xt} = P_{Lt} = P_{At}^{\sigma}$ .

### 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 trade regimes. We start by discussing general equilibrium conditions in Section 3.1, and proceed by discussing the equilibria in closed and open economies in Sections 3.2 and 3.3, respectively.

### 3.1 General

From the profit-maximization problems of firms it follows that returns to capital, land and labour are given by:

$$i_{Kt} = \frac{\partial Y_{Mt}}{\partial K_t} = \alpha(1 + \pi_{Mt}\gamma_t)A_{Mt-1}K_t^{\alpha-1}L_{Mt}^{1-\alpha}, \quad (9)$$

$$i_{Xt} = P_{At}\frac{\partial Y_{At}}{\partial X_t} = P_{At}\alpha X_t^{\alpha-1}L_{At}^{1-\alpha} \quad (10)$$

$$w_{Mt} = \frac{\partial Y_{Mt}}{\partial L_{Mt}} = (1 - \alpha)(1 + \pi_{Mt}\gamma_t)A_{Mt-1}K_t^\alpha L_{Mt}^{-\alpha} \quad (11)$$

$$w_{At} = P_{At}\frac{\partial Y_{At}}{\partial L_{At}} = P_{At}(1 - \alpha)X_t^\alpha L_{At}^{-\alpha} \quad (12)$$

Equation (9) defines returns to effective capital  $K_t$ . Since domestic and foreign capital differ in productivity, returns to each type of capital will differ accordingly. The manufacturing firms' optimal choices of each type of capital input, imply that the returns to domestic and foreign capital, respectively, are given by:

$$i_{Dt} = \frac{\partial Y_{Mt}}{\partial K_{Dt}} = A_{Kt}i_{Kt} \quad (13)$$

$$i_{Ft} = \frac{\partial Y_{Mt}}{\partial K_{Ft}} = i_{Kt} \quad (14)$$

where  $i_{Kt}$  is given by (9).

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

$$L_t = L_{At} + L_{Mt}. \quad (15)$$

Labour can move freely between the two sectors, equalising the wage across sector so that  $w_t = w_{At} = w_{Mt}$ . Equations (11) and (12) imply :

$$P_{At} = (1 + \pi_{Mt}\gamma_t)A_{Mt-1} \left( \frac{K_t}{X_t} \frac{L_{At}}{L_{Mt}} \right)^\alpha \quad (16)$$

### 3.2 Closed Economy

In autarky, prices are endogenously determined in the domestic market. Aggregating the demand functions over the population yields aggregate demand for agricultural goods:

$$Y_{At} = \frac{\sigma}{P_{At}^C} (w_t L_t + r_{Xt} X_t + \mu r_{Kt} K_t), \quad (17)$$

The corresponding expression in the manufacturing sector is:

$$Y_{Mt} = (1 - \sigma)(w_t L_t + r_{Xt} X_t + \mu r_{Kt} K_t) + (1 - \mu) r_{Kt} K_t, \quad (18)$$

where the second term on the right-hand-side is the demand for manufacturing goods used for bequests.

In a closed economy, the relative price of agricultural goods is directly implied by the condition for wage equality (16). The expression shows that the relative price of agricultural goods is proportional to manufacturing TFP, which is increasing in institutional quality. Agricultural goods are also relatively more expensive if land is scarce relative to capital and if there is a high share of labour employed in agriculture.

Combining (9), (16), (17) and (18) the relative labour allocation is given by:

$$\frac{L_{At}}{L_{Mt}} = \frac{\sigma}{1 - \sigma} (1 - \alpha(1 - \mu)). \quad (19)$$

As is standard in specific-factor models, the relative labour allocation across sectors is independent of factor endowments in autarky. This obtains since prices adjust in proportion to the labour share in the two sectors. The term  $\sigma/(1 - \sigma)$  captures 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. Since bequests are made in terms of manufacturing goods, the demand for such goods decreases, as does  $L_{Mt}$ . Stronger preferences for bequests, captured by an increase in  $(1 - \mu)$ , reflects more expenditure on bequests and therefore a higher demand for manufacturing goods and labour in that sector. If bequests were not to matter, so that  $\mu = 1$ , the allocation of labour would be a function of the relative preferences for agricultural versus manufacturing goods as in the standard model.

Equation (19) allows us to rewrite the price equation (16) as:

$$P_{At} = (1 + \pi_{Mt} \gamma_t) A_{Mt-1} \left( \frac{\sigma}{1 - \sigma} (1 - \alpha(1 - \mu)) \frac{K_t}{X_t} \right)^\alpha. \quad (20)$$

By using the price indices derived in Section 2.2. we may define the real returns to domestic capital and land, respectively, as  $r_{Dt} \equiv A_{Kt} i_{Kt} / P_{At}^{\mu\sigma}$  and  $r_{Xt} \equiv i_{Xt} / P_{At}^\sigma$ . By using (9), (10), (15) and (20), we may derive the following Lemma.

**Lemma 1** *In autarky, the real returns to the domestic factors of production are:*

$$\begin{aligned} r_{Dt} &= \theta [(1 + \pi_{Mt} \gamma_t) A_{Mt-1}]^{1-\mu\sigma} \frac{A_{Kt} X_t^{\mu\sigma\alpha} L_t^{1-\alpha}}{K_t^{1-(1-\mu\sigma)\alpha}}, \\ r_{Xt} &= \phi [(1 + \pi_{Mt} \gamma_t) A_{Mt-1}]^{1-\sigma} \frac{K_t^{\alpha(1-\sigma)} L_t^{1-\alpha}}{X_t^{1-\alpha\sigma}}, \end{aligned}$$

$$\text{where } \theta \equiv \frac{\alpha(1+\frac{\sigma}{1-\sigma}(1-\alpha(1-\mu)))^{-(1-\alpha)}}{(\frac{\sigma}{1-\sigma}(1-\alpha(1-\mu)))^{\mu\sigma\alpha}} \text{ and } \phi \equiv \frac{\alpha(\frac{\sigma}{1-\sigma}(1-\alpha(1-\mu)))^{1-\alpha\sigma}}{(1+\frac{\sigma}{1-\sigma}(1-\alpha(1-\mu)))^{1-\alpha}}.$$

The Lemma suggests that the institutional quality,  $\pi_{Mt}$ , is important for the returns to both factors of production, but through separate channels. Stronger institutions that spur manufacturing TFP raise the return to capital by affecting capital's marginal productivity. Land returns are also increasing in institutional quality, but through a decrease in the relative price of manufacturing. Moreover, relative abundance of capital with respect to land increases (decreases) returns to land (capital), while a larger labour stock increases the returns to both factors in their specific sectors.

### 3.3 Open Economy

In an open economy, the relative price of agricultural goods to manufactures is exogenously given by the world relative price,  $P_{At}^*$ . Imposing this condition on (16) implies that relative labour allocation across sectors is given by:

$$\frac{L_{At}}{L_{Mt}} = \left( \frac{(1 + \pi_{Mt}\gamma_t)A_{Mt-1}}{P_{At}^*} \right)^{-1/\alpha} \frac{X_t}{K_t} \quad (21)$$

Under free trade in goods, the allocation of labour between the two sectors is influenced by factor endowments since the prices are fixed and cannot counterbalance them as they do in autarky. The relative allocation of labour in manufacturing is increasing in the quality of economic institutions, the effective capital stock and the world relative price of manufacturing goods.

In analogy to the closed economy, real returns in the open economy are defined as  $r_{Dt} \equiv A_{Kt}i_{Kt}/P_{At}^{*\mu\sigma}$  and  $r_{Xt} \equiv i_{Xt}/P_{At}^{*\sigma}$ . Using (9), (10), (15) and (21), real returns in the open economy may be summarized as follows.

**Lemma 2** *Under free trade in goods the real returns to the domestic factors of production are:*

$$\begin{aligned} r_{Dt} &= \frac{\alpha [(1 + \pi_{Mt}\gamma_t)A_{Mt-1}]^{1/\alpha} A_{Kt}}{P_{At}^{*\mu\sigma}} \left[ \frac{L_t}{P_{At}^{*1/\alpha} X_t + [(1 + \pi_{Mt}\gamma_t)A_{Mt-1}]^{1/\alpha} K_t} \right]^{1-\alpha} \\ r_{Xt} &= \alpha P_{At}^{*(1-\alpha\sigma)/\alpha} \left[ \frac{L_t}{P_{At}^{*1/\alpha} X_t + [(1 + \pi_{Mt}\gamma_t)A_{Mt-1}]^{1/\alpha} K_t} \right]^{1-\alpha} \end{aligned}$$

The Lemma provides interesting insights on the effects of institutional quality, related to the sectoral allocation of labour under free trade. Capitalists benefit from strong institutions as this is conducive to technological progress and raises the marginal productivity of capital. By contrast, stronger economic institutions hurt landowners by drawing labour out of agriculture, thereby decreasing

the marginal productivity of land. In an open economy, landowners can satisfy their demand for manufacturing goods through imports, and internal prices are no longer relevant. Clearly, a higher world price of agricultural goods benefits landowners and translates into a loss for capitalists.

## 4 Introducing International Capital Mobility

We next introduce the possibility that the autocrat may allow foreign, more productive, capital to flow into the country. We assume that returns generated from foreign capital,  $K_{Ft}$ , are measured in terms of domestic goods and transferred back to the country of origin. The real returns to foreign capital are therefore  $r_{Ft} \equiv i_{Ft}/(P_{At})^{\mu\sigma}$  where  $i_{Ft}$  is given by (14) and  $P_{At}$  is given by (16) in a closed economy but equal to  $P_{At}^*$  in an open economy. We further let  $r_t^*$  denote the real rate of return that can be obtained on international capital markets. Finally, we assume that  $A_{Kt}$  is a measure of the degree of spillovers generated by foreign capital inflows so that  $A_{Kt} = A_{Kt}(K_{Ft})$ , where  $A'_{Kt}(K_{Ft}) > 0$ . We start by discussing the equilibrium implications for the closed economy in Section 4.1 and proceed with the open economy in Section 4.2.

### 4.1 Closed Economy

The stock of foreign capital,  $K_{Ft}$ , is governed by the potential returns it will generate in the country. Using (14) and Lemma 1, the real returns to foreign capital in autarky are:

$$r_{Ft} = \theta [(1 + \pi_{Mt}\gamma_t)A_{Mt-1}]^{1-\mu\sigma} \frac{L_t^{1-\alpha} X_t^{\alpha\mu\sigma}}{(A_{Kt}(K_{Ft})K_{Dt} + K_{Ft})^{1-\alpha(1-\mu\sigma)}}. \quad (22)$$

Since  $A'_{Kt}(K_{Ft}) > 0$ , it follows directly that  $\partial r_{Ft}/\partial K_{Ft} < 0$ .

The opportunity cost for foreign investors is given by the returns to capital that prevail on the international market,  $r_t^*$ . Foreign capital enters the country only if returns are at least as high as  $r_t^*$ . Since  $\partial r_{Ft}/\partial K_{Ft} < 0$ , it is sufficient to examine whether the latent return to the first unit of foreign capital entering the country,  $\tilde{r}_{Ft} \equiv r_{Ft}|_{K_{Ft}=0}$ , satisfies this condition. Given that  $\tilde{r}_{Ft} > r_t^*$ , foreign capital will flow into the country until  $r_{Ft} = r_t^*$ . In equilibrium, there are thus no arbitrage opportunities from investing in a particular country. Using (22) we can formulate the following Lemma.

**Lemma 3** *In a closed economy where the following condition holds:*

$$\tilde{r}_{Ft} = \theta [(1 + \pi_{Mt}\gamma_t)A_{Mt-1}]^{1-\mu\sigma} \frac{L_t^{1-\alpha} X_t^{\alpha\mu\sigma}}{(A_{Kt}(0)K_{Dt})^{1-\alpha(1-\mu\sigma)}} > r_t^*,$$

the equilibrium level of foreign capital satisfies  $r_{Ft} = r_t^*$  and is given by

$$K_{Ft} = \max \left\{ 0, \left[ \theta [(1 + \pi_{Mt}\gamma_t)A_{Mt-1}]^{1-\mu\sigma} L_t^{1-\alpha} X_t^{\alpha\mu\sigma} i_t^{*-1} \right]^{\frac{1}{1-\alpha(1-\mu\sigma)}} - A_{Kt}(K_{Ft}) K_{Dt} \right\}. \quad (23)$$

In the expression for latent returns,  $A_{Kt}(0)$  is the lower-bound productivity of domestic capital that obtains in the absence of foreign capital. Since we assume that domestic capital is less productive than foreign capital we let  $A_{Kt}(0)$  be less than unity.

The Lemma suggests that countries promoting technological progress by maintaining strong economic institutions attract more capital, since the rate of return is higher in these countries. Countries with a large relative endowment of effective domestic capital  $A_{Kt}K_{Dt}$ , however, are characterized by lower returns to capital and are therefore less attractive to foreign investors. Note that abundance in land attracts foreign capital in a closed economy through an increase in the relative price of manufacturing goods.

## 4.2 Open Economy

The open economy may be treated analogously. We use (14), Lemma 2 and  $P_{At} = P_{At}^*$  to obtain:

$$r_{Ft} = \frac{\alpha [(1 + \pi_{Mt}\gamma_t)A_{Mt-1}]^{1/\alpha}}{P_{At}^{*\mu\sigma}} \left[ \frac{L_t}{P_{At}^{*1/\alpha} X_t + [(1 + \pi_{Mt}\gamma_t)A_{Mt-1}]^{1/\alpha} K_t} \right]^{1-\alpha}. \quad (24)$$

The expression confirms that real returns to foreign capital are decreasing in the stock of foreign capital also in the open economy, so that  $\partial r_{Ft}/\partial K_{Ft} < 0$ . As before, we may derive a latent return to the first unit of capital entering the economy and prove the following Lemma.

**Lemma 4** *In an open economy where the following condition holds:*

$$\tilde{r}_{Ft} = \frac{\alpha [(1 + \pi_{Mt}\gamma_t)A_{Mt-1}]^{1/\alpha}}{P_{At}^{*\mu\sigma}} \left[ \frac{L_t}{P_{At}^{*1/\alpha} X_t + [(1 + \pi_{Mt}\gamma_t)A_{Mt-1}]^{1/\alpha} A_{Kt}(0)K_{Dt}} \right]^{1-\alpha} > r_t^*,$$

the equilibrium level of foreign capital satisfies  $r_{Ft} = r_t^*$  and is given by

$$K_{Ft} = \max \left\{ 0, \left[ \frac{\alpha(1 + \pi_{Mt}\gamma_t)A_{Mt-1}}{P_{At}^{*\mu\sigma} i_t^*} \right]^{1/(1-\alpha)} L_t - \left[ \frac{P_{At}^*}{(1 + \pi_{Mt}\gamma_t)A_{Mt-1}} \right]^{1/\alpha} X_t - A_{Kt}(K_{Ft}) K_{Dt} \right\}. \quad (25)$$

The result suggests that the likelihood of a positive inflow of capital in an open economy is increasing in the quality of institutions. Although stronger institutions increase the demand for labour in the

economy, they also increase returns to capital by enabling technological progress and one may show that the latter effect always dominates. A smaller stock of effective domestic capital attracts foreign investors also in an open economy. In an open economy, the effect of more land is the opposite to that under autarky: instead of lowering prices, an increase in land lowers the marginal returns to capital by drawing workers out of manufacturing.

## 5 Political Economy

Having identified the equilibrium of the model for given economic institutions and trade and capital regimes, we now add a political layer and endogenize the autocrats' policy choices.<sup>8</sup> As discussed in Section 2, we consider two types of economies that differ only with respect to the endowments of the elites, who may hold either land or capital. As the incumbent autocrat caters to the needs of the elites, their endowments will govern the leaders' objectives. If the elites are endowed with land, we refer to their leader as a landed autocrat and if the elites are endowed with capital, we refer to their leader as a capitalist autocrat.

The autocrat has three policy instruments at his disposal. He can impose barriers to technology adoption by letting  $\pi_{Mt} < 1$  according to (3), he can choose to prohibit trade and he can choose to prohibit foreign capital inflows. For convenience, we define the following policy variables:

$$\pi_{Ot} = \begin{cases} 1 & \text{if there are no barriers to trade (open economy)} \\ 0 & \text{otherwise} \end{cases}$$

$$\pi_{Ft} = \begin{cases} 1 & \text{if there are no barriers to foreign capital inflows} \\ 0 & \text{otherwise} \end{cases}$$

The autocrat thus chooses a policy vector,  $\pi_t = (\pi_{Ot}, \pi_{Ft}, \pi_{Mt})$  to maximize the indirect utility of the elites. The optimal policy of autocrat  $a$  therefore satisfies:

$$\pi_{at} = \arg \max V_{at}(\pi_{at})$$

where  $V_{at}$  is given by (7) and (8) for  $a = K, X$ , respectively. Since the elites' endowments,  $k_{Dt}$  and  $x_t$ , are given in each period, what matters to the autocrat is the real returns to factors of production.

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<sup>8</sup> As discussed in the introduction, imperfect political institutions have been modelled *inter alia* as rent seeking and expropriation in the previous literature. Here we assume that rents from the sector that is of no interest to the elites cannot be expropriated by the autocrat. This is plausible if the ruler needs to maintain order in the society in order to stay in power and avoid a revolution.

We next examine the optimal choices of the two types of autocrats. Due to the complexity of the model, studying the simultaneous interaction between all three policies is analytically intractable. To gain some intuition, however, we next derive some analytical results on the choice of one policy variable holding the other two constant. To this end, we study the interaction between trade and economic institutions in Section 5.1 and proceed by analysing the relationship between trade and foreign capital inflows for each type of autocracy in Section 5.2. Numerical results on the simultaneous interaction between all three policy instruments are then presented in Section 6.

## 5.1 Trade and Economic Institutions

We start by looking at the autocrats' choices of whether or not to open the economy to international trade. A capitalist autocrat prefers free trade if  $V_{Kt}(1, \pi_{Ft}, \pi_{Mt}) > V_{Kt}(0, \pi_{Ft}, \pi_{Mt})$ . Using Lemmas 1 and 2, this inequality is satisfied when:

$$\frac{1}{\left[P_{At}^{*1/\alpha} X_t\right]^{\alpha\mu\sigma}} \frac{\left[\left[(1 + \pi_{Mt}\gamma_t)A_{Mt-1}\right]^{1/\alpha} K_t\right]^{1-\alpha(1-\mu\sigma)}}{\left[P_{At}^{*1/\alpha} X_t + \left[(1 + \pi_{Mt}\gamma_t)A_{Mt-1}\right]^{1/\alpha} K_t\right]^{1-\alpha}} > \frac{\theta}{\alpha}. \quad (26)$$

The result allows us to draw some important conclusions. First, stronger economic institutions in terms of  $\pi_{Mt}$ , favouring technological progress, increase the capitalist autocrat's willingness to engage in trade by making manufacturing firms more competitive. In addition, more effective capital in the form of domestic capital growth, the inflow of foreign capital, or an increase in the productivity of capital, makes a capitalist autocrat more positive towards free trade for reasons of comparative advantage. The world relative price of manufacturing goods, inversely measured by  $P_{At}^{*1/\alpha}$ , also increases the willingness of a capitalist to engage in trade.

For a landed autocrat, the condition is instead  $V_{Xt}(1, \pi_{Ft}, \pi_{Mt}) > V_{Xt}(0, \pi_{Ft}, \pi_{Mt})$ . Lemmas 1 and 2 imply that this obtains when:

$$\frac{\left[P_{At}^{*1/\alpha} X_t\right]^{1-\alpha\sigma}}{\left[\left[(1 + \pi_{Mt}\gamma_t)A_{Mt-1}\right]^{1/\alpha} K_t\right]^{\alpha(1-\sigma)} \left[P_{At}^{*1/\alpha} X_t + \left[(1 + \pi_{Mt}\gamma_t)A_{Mt-1}\right]^{1/\alpha} K_t\right]^{1-\alpha}} > \frac{\phi}{\alpha} \quad (27)$$

The condition suggests that a landed autocrat is more inclined to trade when economic institutions are weak, the economy is relatively well-endowed with land (for reasons of comparative advantage) and when the world relative price of agricultural goods is high. We may formulate the following proposition.



**Proposition 1** *Given that institutions are sufficiently weak, an economy with a comparative disadvantage in manufacturing, i.e. with  $K_t/X_t$  low enough to generate  $P_{At} < P_{At}^*$ , is opened up to trade if ruled by a land autocrat, but remains closed under a capital autocrat.*

**Proof.** Condition (26) does not hold for a sufficiently low level of  $K_t$  since  $K_t$  enters additively in the denominator and with a smaller exponent than in the numerator. A low level of  $K_t$  is tantamount to a comparative disadvantage in manufacturing. By contrast, condition (27) does hold for a sufficiently low  $K_t$  since  $K_t$  appears only in the denominator. ■

The result follows from the fact that owners of a relatively abundant factor, in this case land, prefer free trade to autarky since it raises their real income by inducing a favourable change in relative prices. The opposite holds for owners of relatively scarce factors, in this case capital.

Having established how the autocrats choose trade regime for a given level of  $\pi_{Mt}$ , we next investigate how they choose institutions for a given trade regime  $\pi_{Ot}$ . Equation (7) and Lemmas 1 and 2 reveal that, regardless of the trade regime, it is optimal for a capitalist autocrat to promote economic institutions, since

$$\frac{\partial V_{Kt}(0, \pi_{Ft}, \pi_{Mt})}{\partial \pi_{Mt}} > 0, \quad \frac{\partial V_{Kt}(1, \pi_{Ft}, \pi_{Mt})}{\partial \pi_{Mt}} > 0.$$

Intuitively, stronger institutions are conducive to technological progress in the manufacturing sector, which raises the marginal productivity of capital and therefore raises returns to domestic capitalists.

Turning to the choice of the landed autocrat, equation (8) and Lemmas 1 and 2 imply:

$$\frac{\partial V_{Xt}(0, \pi_{Ft}, \pi_{Mt})}{\partial \pi_{Mt}} > 0, \quad \frac{\partial V_{Xt}(1, \pi_{Ft}, \pi_{Mt})}{\partial \pi_{Mt}} < 0$$

A landed autocrat thus prefers strong institutions in autarky, but weak institutions when the economy is open to trade. Intuitively, strong institutions reduce the relative price of manufacturing goods in a closed economy, which benefits the landed elites by raising returns to land. In an open economy, no such price effect can arise since the relative price is determined in the world market. In a globalized setting, weaker institutions reduce manufacturing TFP growth and therefore the marginal productivity of labour employed in that sector. This leaves more workers in agriculture, which spurs returns to land and benefits landowners. Interestingly, this suggests that globalization changes the incentives of the landed autocrat in a way that is not beneficial for industrial growth.

**Proposition 2** *A capital autocrat always seeks to strengthen economic institutions regardless of whether the country is closed or open to trade. A landed autocrat supports institutions conducive to technology adoption in autarky but blocks institutional improvements in an open economy.*

**Proof.** The results follow trivially from differentiating the returns in Lemmas 1 and 2 with respect to  $\pi_{Mt}$ . ■

Note that since the share of workers employed in agriculture is fixed in a closed economy, the rise in the relative price of agriculture benefits the landed elites by raising their real income. Consequently, a land autocrat has incentives to improve economic institutions that promote technology adoption under autarky. In an open economy, however, relative prices do not change. Workers, therefore, respond to changes in economic institutions by moving into the sector that pays the highest wages. A landed autocrat is therefore enticed into blocking technological improvements as higher growth in manufacturing TFP would cause migration from agriculture to manufacturing. The key difference between the closed and open setting is that, in autarky, relative prices neutralize any changes in productivity across sectors and this leaves the allocation of labour unchanged. In an open economy, however, relative prices are fixed, which makes the allocation of labour sensitive to the relative performance of the two sectors, giving the ruling autocrat stronger incentives to improve the relative performance of the sector in which the elites' primary factor is employed.

## 5.2 Trade and Foreign Capital Inflows

We now turn to the autocrats' decisions on whether or not to allow for the inflow of foreign capital under different trade regimes. On the entry of foreign capital, what matters is not only how the autocrat sets  $\pi_{Ft}$ , but also whether returns are such that the country is able to attract foreign capital. This implies that  $\pi_{Ft}$  and  $\pi_{Mt}$  interact in important ways. In this section, we consider the choice of  $\pi_{Ft}$  for a given trade regime and for given institutions.

Starting with the optimal policies of the capitalist autocrat, Lemma 1 shows that the effect of foreign capital on the returns to domestic capital is ambiguous in a closed economy. Foreign capital enters the denominator of domestic returns since it lowers the marginal productivity of domestic capital due to diminishing returns. However, foreign capital also enters the numerator through its technological spillovers on domestic capital, captured by  $A_{Kt}(K_{Ft})$ . A capitalist autocrat thus only favours capital inflows if the gains from the productivity spillovers dominate the losses from the direct reduction in the marginal productivity of capital, i.e.

$$\frac{dV_{Kt}}{dK_{Ft}} > 0 \text{ if } \frac{\partial V_{Kt}}{\partial A_{Kt}} \frac{\partial A_{Kt}}{\partial K_{Ft}} > \frac{\partial V_{Kt}}{\partial K_{Ft}}.$$

Differentiating (7) with respect to  $K_{Ft}$ , using Lemmas 1 and 2, we find that

$$\frac{dV_{Kt}(0, \pi_{Ft}, \pi_{Mt})}{dK_{Ft}} > 0 \text{ if } \psi_t > (1 - \alpha(1 - \mu\sigma)) \equiv \psi_t(0, \pi_{Ft}, \pi_{Mt}), \quad (28)$$

where  $\psi_t \equiv K_{Dt} A'_{Kt}(0) / (1 + K_{Dt} A'_{Kt}(0)) \in [0, 1]$  is an index of potential spillovers from foreign capital at the point where no foreign investment has yet taken place in the country. In the open economy, the condition becomes:

$$\frac{dV_{Kt}(1, \pi_{Ft}, \pi_{Mt})}{dK_{Ft}} > 0$$

$$\text{if } \psi_t > (1 - \alpha) \frac{A_{Kt}(0) K_{Dt} [(1 + \pi_{Mt} \gamma_t) A_{Mt-1}]^{1/\alpha}}{(P_{At}^{*1/\alpha} X_t + [(1 + \pi_{Mt} \gamma_t) A_{Mt-1}]^{1/\alpha} A_{Kt}(0) K_{Dt})} \equiv \psi_t(1, \pi_{Ft}, \pi_{Mt}), \quad (29)$$

In (29), it is easy to see that  $\psi_t(1, \pi_{Ft}, \pi_{Mt}) < 1 - \alpha$ , and since  $1 - \alpha < (1 - \alpha(1 - \mu\sigma))$ , (28) and (29) imply:

$$\psi_t(0, \pi_{Ft}, \pi_{Mt}) > \psi_t(1, \pi_{Ft}, \pi_{Mt}) \quad (30)$$

In other words, the threshold spillovers above which the capitalist autocrat chooses to allow the inflow of foreign capital are higher in a closed economy than in an open economy. All else equal, the capital autocrat is therefore more in favour of foreign capital inflows in an open economy than in a closed economy. Thus, as long as spillovers are sufficiently large to satisfy (29), he chooses to allow capital mobility when open to trade but not in autarky.<sup>9</sup> We conclude that allowing for trade and capital mobility are *complementary policies* in a capital autocracy.

The choice of the landed autocrat is more straightforward. Lemmas 1 and 2 imply that a landed autocrat is in favour of the entry of foreign capital in a closed economy, but against it in an open economy:

$$\frac{dV_{Xt}(0, \pi_{Ft}, \pi_{Mt})}{dK_{Ft}} > 0, \quad \frac{dV_{Xt}(1, \pi_{Ft}, \pi_{Mt})}{dK_{Ft}} < 0. \quad (31)$$

The landed autocrat is thus more in favour of foreign capital inflows in a closed economy than in an open economy and we conclude that allowing for trade and capital mobility are *substitute policies* in a land autocracy.<sup>10</sup> We may formulate the following proposition.

**Proposition 3** *Allowing for international trade and for the inflow of foreign capital are complementary policies in a capital autocracy but substitute policies in a land autocracy.*

**Proof.** The result for the capital autocracy follows from (28) and (29). The result for the land autocracy follows from differentiating (8) with respect to  $K_{Ft}$  using the returns in Lemmas 1 and 2. ■

<sup>9</sup> Note that very high levels of  $\psi_t$ , at which the landed autocrat would favour capital inflows also in autarky, are not relevant for our analysis. In such cases excessive spillovers discourage foreign investors, as can be seen from  $A_{Kt}$  appearing in the denominator of the latent returns to foreign capital and entering negatively in the equilibrium level of foreign capital in Lemmas 3 and 4.

<sup>10</sup> Moreover, since we know from Proposition 1 that the landed autocrat maintains weak institutions when open to trade, foreign investors would be less likely to invest in the country, even if they were allowed to do so.

The mechanism that causes trade and capital inflows to be substitutes in a land autocracy is closely linked to the result in Proposition 2. In a closed economy, a larger capital stock (and more efficient domestic capital) raises the relative price of agricultural goods and hence the real income of a landowner. Under free trade, however, a larger capital stock will affect the sectoral allocation of workers to the disadvantage of landowners. For a capital autocracy, the problem is very different. The inflow of foreign capital potentially has three effects on domestic capitalists and these effects go in opposite directions as far as the real returns to capital are concerned. The positive effect of foreign capital is that it causes technological spillovers that raise the productivity of domestic capital. The two negative effects are, first, that, for a given allocation of labour, more capital implies more capital per worker in the manufacturing sector and this lowers the marginal productivity of all capital. Second, the foreign capital increases the supply and lowers the relative price of manufacturing goods. In autarky, all three effects are present. Under free trade, however, the third effect disappears since relative prices are fixed. Therefore, the capitalist autocrat is more likely to favour capital inflows under free trade than under autarky.

## 6 Numerical Simulation

To illustrate the simultaneous interaction between institutional quality, goods trade and the inflow of foreign capital, we next display numerical solutions to the model. We solve for the optimal policies in each period and simulate the economy over time. We start out in a state where the economy holds a comparative disadvantage in manufacturing and study each autocrat's decision to open up to trade and allow for foreign capital inflows. When possible, we try to match key statistics for the South Korean economy in parameterizing the model and therefore think of the capital autocracy as a crude representation of this economy. By studying the development of the land autocracy for the same set of parameters, we may think of the results for the land autocracy as representing an interesting counterfactual, namely how South Korea would have evolved if its leaders had catered to the preferences of its landowners rather than to those of its capitalists.

### 6.1 Parameters

In parameterizing the model, we set the capital share in manufacturing, and thus the land share in agriculture, to match the average labour share of .703 reported for the South Korean economy over the period 1966-90 by Young (1995), and let  $\alpha = .297$ . In choosing the consumption share of

income,  $\mu$ , we note that bequests correspond to domestic investments in our setting. We thus set  $\mu$  to match the .081 investment share of GDP in South Korea in 1960, obtained from the Penn World Tables 7.1, and let  $\mu = .919$ . We have no prior on how to set the agricultural share of consumption but let  $\sigma = .10$  in the benchmark simulation. In modelling the growth process of manufacturing TFP, we follow Hansen and Prescott (2004) in choosing an average annual growth rate of 1.4 per cent. Since one model period spans one generation, we convert these annual rates to 30-year equivalents and let  $\gamma = .518$ .<sup>11</sup>

We also need estimates of the population shares. To the best of our knowledge, direct estimates of the share of landowners and capitalists in South Korea are not available, but since these households represent the potential elites, they are bound to be a small number. In the benchmark we want to make the two groups of elites equally influential in their respective economies and therefore set  $N_X = N_K = .05$ . Since the population is normalized to one, this implies  $L = .90$ . As stated in the theoretical section, each landowner holds one unit of land, which implies that the total land endowment in the economy is  $X_t = N_X = .05$ .

We have no prior on how to set the international relative price of agricultural goods but since we want to mimic South Korea's transition from a closed to an open economy, we make sure that the economy starts out with a comparative disadvantage in manufacturing by ensuring that  $P_A^* < P_{A0}$ , and let  $P_A^* = 1$ . The final set of parameters are related to the inflow of foreign capital. We choose a simple, linear relation between  $K_F$  and  $A_K$  and assume:

$$A_K = \kappa_1 + \kappa_2 K_{Ft},$$

where  $\kappa_1 \in (0, 1)$  and  $\kappa_2 > 0$ . Since we want domestic capital to be less productive than foreign capital when  $K_{Ft} = 0$  and spillovers from foreign capital to be positive, we let  $\kappa_1 = .80$  and  $\kappa_2 = 1.5$ . We set the international real interest rate such that foreign investors would like to invest in the capital autocracy, given the opportunity to do so, and let  $r^* = 6$ .

In addition to these fundamental parameters, a set of initial conditions for the capital endowment and manufacturing TFP need to be specified. We set these to ensure that the capital stock is non-decreasing in the closed capital autocracy, and let  $k_0 = .05$  and  $A_{M0} = 1.5$ .

Finally, we impose a bound on the autocrat's ability to block technological progress. In the

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<sup>11</sup> This is a conservative estimate. An alternative would be to set the annual TFP growth rate to match the average annual growth rates of 3 percent over the period 1966-90, as reported in Table VII in Young (1995). However, since we think of the starting date for our experiment as pre-1960 we opt for a more modest growth rate. Moreover, we wish to study how policy choices affect the evolution of the two types of autocracies and thus seek to minimize the exogenous influence on the economies.

Table 1: Optimal policies in the capital and land autocracies.

	$t$	1	2	3	4	5	6	7	8	9	10
Capital autocracy	$\pi_{Ot}$	0	0	1	1	1	1	1	1	1	1
	$\pi_{Ft}$	0	0	0	0	0	0	0	0	1	1
	$\pi_{Mt}$	1	1	1	1	1	1	1	1	1	1
Land autocracy	$\pi_{Ot}$	1	1	1	1	1	1	1	1	1	1
	$\pi_{Ft}$	0	0	0	0	0	0	0	0	0	0
	$\pi_{Mt}$	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1

extreme case, we would let  $\pi_M \in [0, 1]$ , but to ensure that there is some growth in manufacturing TFP even when the autocrat chooses to block new technology, we let  $\pi_M \in [.1, 1]$ . The other two policy variables  $\pi_O$  and  $\pi_F$  are dichotomous dummies capturing whether the autocrat allows for trade in consumption goods and capital goods, respectively.

## 6.2 Results

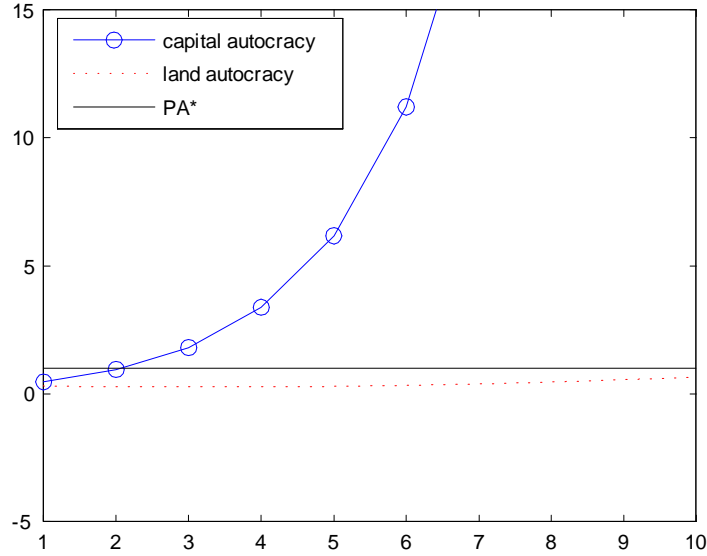


Figure 1: The relative price of agricultural goods in the two economies.

Table 1 displays the optimal policies from the benchmark experiment in the two types of autoc-

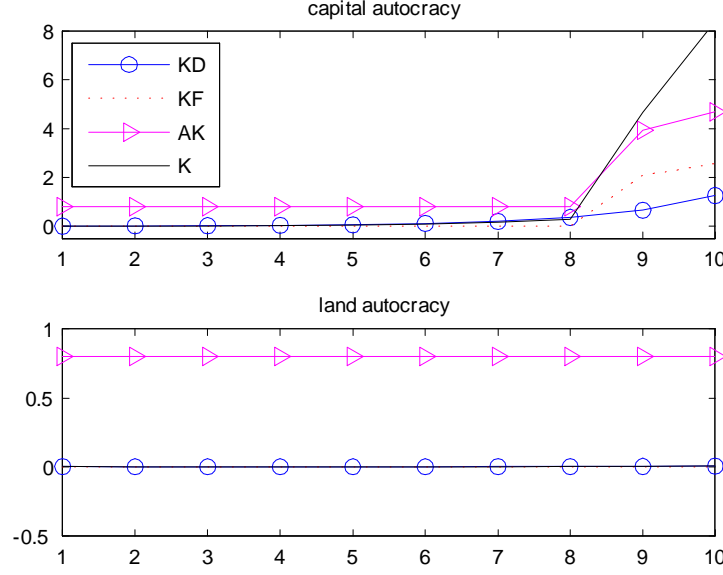


Figure 2: The evolution of domestic capital (KD), foreign capital (KF), productivity of domestic capital (AK) and effective capital (K) in the two economies.

racies. To understand how these policies affect the comparative advantage of the economies, it is useful to simultaneously study the impact of these policies on the evolution of the relative price of agricultural goods, displayed in Figure 1. The capitalist autocracy starts out with a comparative disadvantage in manufacturing, so that the relative price of agricultural goods in this economy is lower than the world-market price  $P_A^*$ . Consequently, the capitalist autocrat initially maintains a closed economy. As shown in Table 1, the autocrat keeps strengthening economic institutions and sets  $\pi_M$  to one. The strong institutions promote technological progress and spur manufacturing TFP growth, which gradually shifts the comparative advantage of this economy from agriculture to manufacturing. Figure 1 suggests that in period 3, the relative price of agricultural goods has become higher than the world-market price of these goods in the capital autocracy. Since the relative price of agricultural goods is the inverse of the relative price of manufacturing goods, this suggests that the relative price of manufacturing goods now has become lower than the world-market price on these goods, i.e. the economy has developed a comparative advantage in manufacturing. This makes the capitalist autocrat favourable to international trade, and as indicated in Table 1, he sets  $\pi_O = 1$  from period 3 onwards. The upper panel of Figure 2 displays the evolution of domestic capital, the inflow of foreign capital, the implied relative productivity of domestic capital and

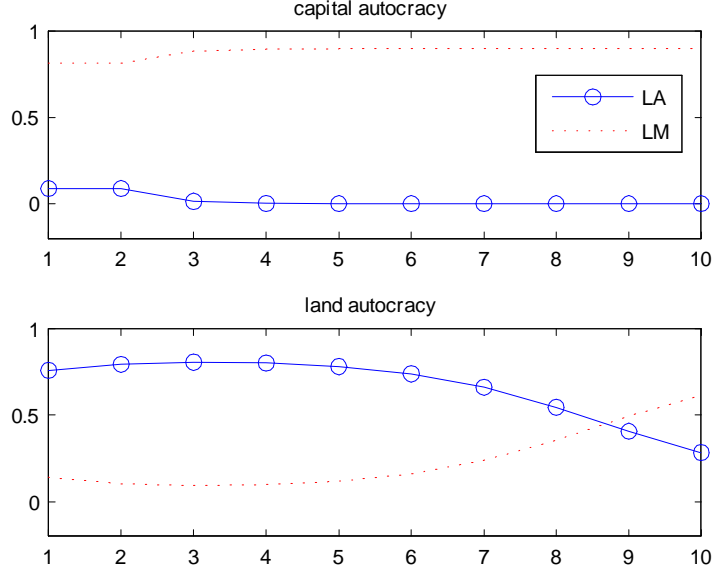


Figure 3: The allocation of labour to the agricultural (LA) and the manufacturing sector (LM ) in the two economies.

the total effective capital stock in this economy. The graphs suggest that the strong institutions promote domestic capital accumulation by generating high returns to this factor. Turning to the autocrat's decision to allow for the inflow of foreign capital, the results in Table 1 suggest that the autocrat allows for such inflows from period 9 onwards. The reason is that the potential spillovers from such capital, as captured by  $\psi_t$  in (29), is increasing in domestic capital. Once the autocrat decides to set  $\pi_F = 1$ , the strong institutions and high returns to capital have made the economy attractive to investors and foreign capital will flow into the country. As shown in Figure 2, the inflow of foreign capital boosts the total effective capital stock through two channels: in addition to having a direct effect on  $K$ , it increases the relative productivity of domestic capital. Moreover, the increase in the productivity of domestic capital will dampen some of the fall in returns generated by a growing capital stock. 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. The upper panel of Figure 3 displays the structural transformation of this economy in terms of the allocation of labour across the two sectors. The plot corroborates the analytical result (19), that in the first two periods of autarky, employment in the two sectors is constant, with the majority of the workforce employed in the manufacturing



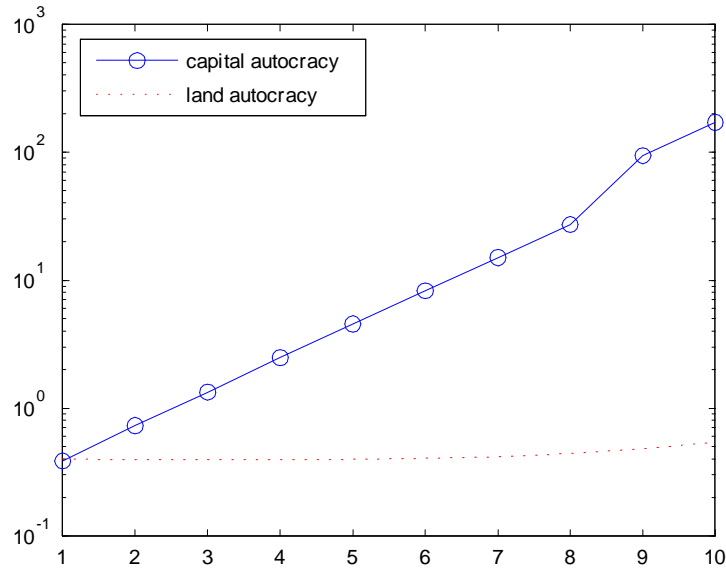


Figure 4: The evolution of GDP in the two economies (log scale).

sector. Once the economy has gained a comparative advantage in manufacturing and opens up to trade, additional labour is drawn out of agriculture until most of the workforce is employed in the manufacturing sector. This intersectoral reallocation of workers is consistent with findings reported in Young (1995). Finally, Figure 4 reports the evolution of GDP over time. The graph shows that the capital autocracy grows at a steady but moderate pace for the first 8 periods. Once foreign capital is allowed into the country in period 9, however, the growth rate increases dramatically and boosts GDP.

We next consider the evolution of the same economy, but under the rule of a landed autocrat. Since the economy starts out with a comparative advantage in agriculture, the landed autocrat opens up to trade immediately as the relative price of agriculture is lower than the relative world-market price of these goods. The results in Table 1 indicate that the landed autocrat sets  $\pi_O = 1$  from period 1 onwards and Figure 1 corroborates that  $P_A < P_A^*$  in this economy. Consistent with Proposition 2, the results in Table 1 show that in this open environment, the landed autocrat neglects economic institutions and sets  $\pi_M$  at the lower bound. The barriers to technological progress that ensue cause manufacturing TFP to grow at a modest rate. The graph in Figure 1 reveals that this moderate growth rate causes the relative price of agricultural goods that would prevail in autarky to increase somewhat over time, but the increase in manufacturing productivity

is not sufficiently large to overturn the comparative advantage in agriculture within the time frame of the experiment. The lower panel of Figure 2 shows that the weak institutions that are sustained in this open economy are detrimental to capital formation. The moderate growth in manufacturing TFP generates low returns to capital and deters capital accumulation. Consistent with Proposition 3, it is never optimal for the landed autocrat to allow for foreign investment. Turning to the sectoral allocation of labour in Figure 3, the lower panel shows that the moderate growth in manufacturing TFP causes a gradual reallocation of some of the workforce from agriculture to manufacturing. However, this structural transformation is much slower than in the capital autocracy and obtains only because we set the lower bound on  $\pi_M > 0$ . Finally, the graph of GDP in Figure 4 confirms that the weak institutions, moderate manufacturing TFP growth and failure to encourage capital accumulation, constitute a path toward stagnation.

## 7 Discussion

Historical accounts suggest that the politically influential group of any country tends to be in possession of the economy's natural resources. In traditionally agrarian economies, such as Argentina in the 19th century, the political power of landowners is undisputed, see for instance Taylor (1997). However, in more industrialized economies with a developed business sector, the elites instead tend to be capitalists who derive profits from manufactures. South Korea is an example of an economy where the powerful industrial families of the Jaebols constituted a politically influential group from the 1950s onwards, see for instance Kim (1976). The strong influence of capitalists and bankers in Shanghai under the Kuomintang regime in the late 1920s is also well documented, see for instance Coble (1979).

The model's predictions for the land autocracy are broadly consistent with the evolution of the landed Latin American economies of the 19th century. These economies opened up to trade at an early stage of development, focusing on exports of primary goods. Since the elites were predominantly landowners in these economies, the model provides a rationale for why they favoured globalization early on. The model is also consistent with the weak institutions that were a feature of the Latin American landscape at the time and can help explain why the region failed to attract foreign investors. In Argentina, the period prior to the Peronist rule as well as the period of military rule in the 1980s, were characterized by liberal trade policies combined with poor institutional settings. One caveat of our model is that it does not allow for the possibility of import substitution

- an important chapter in the economic history of, for instance, Argentina. However, import substitution appears to have been more important under the more democratic Perón government than under both the preceding autocratic governments and the subsequent military rulers who were influenced by large landowners and favoured trade liberalization (Galliani and Torrens, 2011).<sup>12</sup> Import-substitution policies are likely to have played an important role in the development of several important economies in Latin America and elsewhere, but are beyond the scope of the model and left for future research.

The model's predictions for the capital autocracy help shed some light on some of the mechanisms likely to have been at work in some East Asian economies in the postwar era, for example South Korea and Taiwan. As discussed above, it is often believed that the autocratic governments in these two countries were heavily influenced by industrialists and the financial industry. Rodrik (1994) emphasizes that the governments in these economies prioritized industrial development and sought to affect comparative advantage by various policy measures. The GDP per capita levels in these two countries were in 1960 on par with those in many sub-Saharan countries and well below those of several large Latin American countries such as Brazil, Argentina or Mexico. During the following three decades, however, the average growth rates of GDP per capita have averaged almost 7 percent. The cases of Taiwan and South Korea closely follow our predictions. In the 1960s, domestic levels of investment rose sharply and many have argued that this rise in investment was strongly connected to government policy. Rodrik (1994) writes:

“... in the early 1960s and thereafter the Korean and Taiwanese governments managed to engineer a significant increase in the private return to capital. They did so not only by removing a number of impediments to investment and establishing a sound investment climate, but more importantly by alleviating a coordination failure which had blocked economic take-off”. (p. 2)

Importantly, however, export to GDP ratios remained relatively low throughout the 1960s but rose sharply, in fact almost doubled, during the early 1970s. The 1970s and the 1980s were also

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<sup>12</sup> Several studies addressing the stagnation of Latin America identify the concentration of land ownership as a possible culprit, see for instance Persson and Tabellini (1994), Engerman and Sokoloff (2000) and Adamopoulos (2008). Galor, Moav and Vollrath (2009) show that inequality in land ownership may be detrimental to the emergence of institutions promoting human capital and may therefore delay industrialization. On a similar note, Galliani et al. (2008) study investments in public education in 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.

the decades when Taiwan started to receive large inflows of foreign direct investment.<sup>13</sup> These two countries thus remained closed well into the 1960s, while the capital stock and competitiveness grew. In time, however, the rulers in these countries found it favourable to enter world markets and started to allow for foreign capital inflows. This sequence of events: i) low levels of trade and FDI but high levels of investment and TFP growth before the 1970s; ii) opening up to trade in the early 1970s; and iii) substantial capital inflows during the later 1970s and 1980s, follows our model's predictions very closely.

In sum, the most common views on the development of Argentina, South Korea and Taiwan are largely consistent with our model. Building a model that is in line with the consensus view of the factor endowments of the political elites in these countries, we demonstrate how the interaction between institutional quality and trade in goods and capital is capable of generating sequences of events in accordance with actual developments in these economies.

## 8 Concluding Remarks

In this paper we present a specific-factor model of an economy where the ruling autocrat may or may not strengthen technology-promoting institutions, open up to trade and allow for foreign capital inflows. We argue that the endowments of the political elites, and therefore the preferences of the incumbent autocrat, can have far-reaching effects on the economy's long-run development. We show that institutional quality and openness to trade in goods and capital interact in ways that may help explain the heterogeneous performance of economies with imperfect political institutions.

We illustrate the workings of the model by simulating an economy that starts out with a comparative disadvantage in manufacturing and vary the assumption about the nature of the political elites. We find that if the political elites are endowed with land, the autocrat is likely to embrace globalization at an early stage. Opening up to trade, however, creates an adverse incentive not to enforce institutional quality or allow for foreign capital inflows, which discourages capital accumulation. In such a land-oriented autocracy, allowing for trade and foreign capital inflows are substitute policies and due to the weak institutions that ensue, the economy is bound to stagnate over time. We argue that the results for the land autocracy are broadly consistent with the developments in Argentina during the pre-Perónist era and during the military rule of the 1980s.

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<sup>13</sup> Source: *Statistics on Approved Overseas Chinese and Foreign Investment by Area*, the Investment Commission, Ministry of Economic Affairs, Taiwan.

If the political elites are instead endowed with capital, the autocrat is likely to maintain a closed economy while strengthening economic institutions. The continuous strengthening of institutions will lead to capital accumulation and a gradual shift towards a comparative advantage in manufacturing that eventually will make the autocrat favour international trade. The strong institutions will make the economy attractive to foreign investors and productive capital will flow into the country and spur the accumulation of effective capital. In a capital autocracy, trade in goods and capital are thus complementary policies that will lead to rapid growth and long-term development. We argue that our results for the capital autocracy are consistent with actual developments in the Tiger Economies of South Korea and Taiwan during the postwar period.

We have chosen to model an autocracy rather than a democracy since this simplifies the political-economy layer of the model. However, our results would obtain also in a democracy where the political elites could form a political lobby and exert pressure on the democratic leader. The results could thus be derived from a more general framework with imperfect political institutions.<sup>14</sup>

The model can be extended in several interesting dimensions. It would be interesting to study the foundations of institutions in greater detail and to add microfoundations for firms' incentives to invest in new technology. Another 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.

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<sup>14</sup> See for instance Levchenko (2012) for a framework with political lobbying or Galiani and Torrens (2011) for a model of conflict between the elites.

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## Appendix A1: Utility Maximization

Denote the bequests given in terms of capital and land by  $B_{Kt}$  and  $B_{Xt}$ , respectively. The problem facing the capitalist household is then:

$$\max_{C_{At}, C_{Mt}, B_{Kt}} U(C_{At}, C_{Mt}, B_{Kt}) = (C_{At}^\sigma C_{Mt}^{1-\sigma})^\mu B_{Kt}^{1-\mu}$$

subject to

$$P_{At}C_{At} + P_{Mt}C_{Mt} + P_{Bt}B_{Kt} \leq I_{Kt}$$

The optimal choices of the capitalist household are:

$$\begin{aligned} C_{At} &= \mu\sigma \frac{I_{Kt}}{P_{At}}, \\ C_{Mt} &= \mu(1-\sigma) I_{Kt}, \\ B_{Kt} &= (1-\mu) I_{Kt}. \end{aligned}$$

The problem facing the landed household is:

$$\max_{C_{At}, C_{Mt}, B_{Xt}} U(C_{At}, C_{Mt}, B_{Xt}) = (C_{At}^\sigma C_{Mt}^{1-\sigma})^\mu B_{Xt}^{1-\mu}$$

subject to

$$\begin{aligned} P_{At}C_{At} + P_{Mt}C_{Mt} &\leq I_{Xt} \\ B_{Xt} &\leq x_t = 1 \end{aligned}$$

where  $x_t \equiv X_t/N_{Xt}$  denotes land holdings per landowner. The optimal choices of the landed household are:

$$\begin{aligned} C_{At} &= \sigma \frac{I_{Xt}}{P_{At}}, \\ C_{Mt} &= (1-\sigma) I_{Xt}, \\ B_{Xt} &= 1. \end{aligned}$$



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