Essays on International Trade and Institutions.

by

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Abstract

This dissertation consists of three essays in the intersection of International Trade and Institutions.

The first essay looks at the effect of trade opening on the efficiency of institutions. I argue that part of the reason why some developing economies have not experienced a boost in economic performance despite increasing trade openness may be related to the interaction between weak institutions and trade. In particular, I construct a model in which trade opening in societies with weak political institutions may lead to worse economic policies. The reason is that general equilibrium price effects of taxation and expropriation in closed economies also hurt the elites, and this puts a natural barrier against inefficient policies. Trade openness removes this barrier and enables groups with political power to exercise this power in more inefficient ways.

In the second essay, I analyze how the inefficiency of weak political regimes is shaped by the elites' factor endowments, and how those inefficiencies alter standard predictions about international trade and capital flows. Elites always distort sectors that use intensively factors they own on a larger share less, irrespective of the endowment of the economy. This implies that, with trade opening, predictions about factor content of trade can be reversed if the elites' factor endowments differ from that of the economy. A capitalist elite will distort capital-intensive sectors less than others, which may more than compensate for the scarcity of that factor, and make the country a net exporter of capital-intensive goods. Also, when opening to international capital markets, the direction of capital flows can be reverted. The elites will distort capital-intensive sectors less, which may more than compensate for the abundance of capital, and drive its return above that on the rest world.

The third essay provides econometric evidence that the model in the first essay is consistent with the data. Using a panel of 92 countries and 17 years, I show that non-democratic regimes that trade more experience more expropriation, while this is not the case for democratic regimes. The results are robust to different econometric specifications and different sets of controls.

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A la meva dona, Mercè

Contents

Chapter 1

Inefficient Policies, Inefficient Institutions and Trade

Summary 1 *Despite the general belief among economists on the growth-enhancing role of international trade and significant trade opening over the past 25 years, the growth performance of many developing economies, especially of those in Latin America and Africa, has been disappointing. While this poor growth performance has many potential causes, in this paper I argue that part of the reason may be related to the interaction between weak institutions and trade. In particular, I construct a model in which trade opening in societies with weak institutions (in particular autocratic and elite-controlled political systems) may lead to worse economic policies. The reason is that general equilibrium price effects of taxation and expropriation in closed economies also hurt the elites, and this puts a natural barrier against inefficient policies. Trade openness removes this barrier and enables groups with political power to exercise this power in more inefficient ways.*

1.1 Introduction

Increasing globalization has been a defining feature of the postwar era. There is some consensus that this has been beneficial for economic performance: trade brings about a more efficient allocation of resources through technology or factor endowment driven comparative advantage, or through better exploitation of increasing returns to scale. Figure 1 gives a sense of this. Countries that traded more between 1960 and 1995 appear to have larger per capita incomes today.[1]

At the same time, some less-developed economies have seen little improvement in economic performance since the 1960's. Figure 2 splits Figure 1 in two. On the top are countries that, from 1960 to 2000, had on average limited or no constraints on executive power (non-democratic regimes). The bottom section shows countries with strong checks on the executive power over the same period (more democratic regimes). A positive correlation between trade and income holds for more democratic countries, but for less democratic regimes there is no positive correlation. It could be argued that this is unrelated to globalization, or that these countries have not opened to trade enough to benefit from it. However, trade as a share of GDP in those countries has increased from an average of 33% in 1960, to an average of almost 60% in 2000.[2] Although most trade takes place between developed nations, it is still true that less-developed economies today trade much more than they did 40 years ago.

The alternative view developed in this paper is that our standard trade models are missing an important ingredient. If we are to look for a fundamental difference between countries in the North and countries in the South that might affect trade predictions, institutions stand out as a clear candidate. How do institutions in the North differ from those in the South? The answer is straightforward: institutions in the South tend to be less efficient, their economies are characterized by corruption, expropriation, or weak property rights protection.

Do countries with inefficient institutions, then, benefit from trade in the way our standard models would predict? Trade theories typically formalize differences in institutions as differences in exogenous parameters or differences in productivity. But institutions in the South are

[1] We are aware of the standard omitted variable and reverse causality problems. We are just describing correlations.

[2] The measure we are using is exports plus imports as a share of GDP from the Penn World Tables.

inefficient in a distortive way: groups with political power tend to extract rents from other groups in society, which affects the incentives in these economies. Such inefficiencies can alter standard trade predictions in two ways. First, they can have distributive consequences: winners and losers from the process of trade integration may differ from those predicted by standard theories.[3] Second, trade might affect the inefficiency of institutions itself. Exogenous differences in productivity parameters are not likely to capture the effects of institutional variance.

The main contribution of this paper is to answer this question, endogenizing the efficiency of institutions and analyzing how this efficiency changes when economies open to international trade. I argue that part of the reason why less-developed economies may not have benefited from international trade is that, in countries with weak or non-democratic political institutions, trade liberalization may lead to worse policies and economic institutions. The reasoning is simple: in a closed economy, groups that hold political power are restrained in the degree to which they may indulge inefficient redistributive policies, such as corruption or expropriation, because of the general equilibrium price effects such policies create. Increased international trade removes these price effects, and may increase the intensity of rent-extracting policies to the point where it more than outweighs for standard trade gains. In such situations, trade may not be welfare enhancing.

To examine this issue, I build on Acemoglu (2005), which provides a framework to help understand why inefficient institutions emerge. The starting point of my paper is a society that already has an elite with a preference for inefficient policies in place. In particular, I start with a set of political institutions that give all political power to an elite minority. This power allows the elite to benefit from its policies regardless of how they affect the rest of society. Throughout this paper, this state is the definition of the term "dictatorship." The key policies in this model are group specific tax rates, which are distortionary. In this model there are no other means to extract resources from non-elite groups. The definition of taxation in this discussion is broad: it is any policy that leads to investment distortions in the economy (such as expropriation or corruption).

I focus on two sources of inefficiency in policies, both arising from the desire and ability of the elite to extract resources from other groups. First, the elite might set distortionary taxes

[3]Levchenko (2004) is an example of this.

to extract revenue from other groups. We refer to this as Revenue Extraction. Second, because they participate in production activities, the elite producers can also benefit through an indirect channel. By taxing other groups with production activities, they reduce the demand for factors of these groups. This benefits them through lower factor prices and higher profits. We refer to this second source of inefficiency as Factor Price Manipulation. The degree of expropriation in the economy and its effect will depend on the strength of these two sources of inefficiencies.

I first analyze the closed economy. In Acemoglu (2005), elite and non-elite producers compete in the same sector; i.e., products of both groups are perfect substitutes.[4] I depart from that assumption by allowing elite and non-elite producers to produce in different sectors and assuming that these sectors have certain complementarity. This immediately implies a natural restriction on the extent to which the elite can either extract resources from the middle class or modify factor prices. Any taxes the elite place on the middle class will come back to affect them. Higher taxes will imply a higher cost for the consumption bundle, which will reduce the real value of the elites' income. And this is true for both sources of inefficiency, Revenue Extraction and Factor Price Manipulation. Taxing these non-elite groups will not only directly reduce non-elite producers investment (the standard Laffer Curve effect) but also, because goods produced by these non-elite producers will become more expensive, reduce the value of the elite's profits. In other words, as long as the elite consumes what non-elite groups produce, the elite will find expropriation and excessive taxation less desirable because these policies will make consumption more expensive.

The key assumption in this analysis is that elite producers care, not only about tax revenues, but also about profits. This encourages them to tax both sectors asymmetrically, since taxing themselves hurts profits. But taxing sectors differently distorts the relative price and allocation of resources in the economy. And this also reduces profits through the general equilibrium: a tax on the middle class decreases the relative price of the goods produced by the elite, which decreases profits. This is what limits the elite from taxing other groups as much as they would like.

Opening the economy to trade will increase competition, which will increase the substitutability between goods produced by elite and non-elite producers. In other words, trade

[4] Additionally, Acemoglu (2005) only analyzes a closed economy.

will reduce the negative general equilibrium effect (on the elites' income) of taxing these other groups; now, the elite can find most goods in world markets. This frees the elite to take full advantage of their policy control, translating into greater inefficiency as taxes rise aggressively on all other groups. The welfare implications of opening to trade will depend on whether the increase in expropriation more than outweighs for the standard gains from trade. The most important result of this paper is its assertion that, in dictatorial states, international trade is not necessarily welfare improving for the whole economy.

I then repeat the analysis for a democracy, which we define as political institutions that give all political power to the majority. A democracy with a closed economy will be inefficient to some extent, although generally less inefficient than a dictatorship. The surprising result is that once we open to trade, policies do not necessarily become more efficient; instead, they remain constant. A look at the nature of our democratic model explains this. A democracy gives the political power to the majority, and in our model that majority is comprised of workers. Since workers participate in both sectors of the economy, they will try not to distort resource allocation across sectors. Also, workers care about wages (not profits), which implies that the general equilibrium effect will not restrain them from achieving their desired tax rates. When the country opens to trade, workers will set the same tax rates as in the closed economy, and opening to trade will not have a negative effect on the efficiency of policies. Trade is always welfare enhancing under a democracy.

The main contribution of this paper is to emphasize the negative impact that trade has on expropriation and income of countries with weak political institutions, by making non-elite and elite sectors more substitutable. The literature has emphasized how globalization, by allowing capital mobility, leads to lower taxation. I abstract from this mechanism by assuming that there is no international factor mobility.[5] The paper most closely related to this one, in spirit, is Bourguignon and Verdier (2000).[6] In their model, an oligarchy of capitalists, operating in an economy with missing financial markets for the financing of human and physical capital investments, might find it in their interest to subsidize the education of the poor because

[5]It is not obvious how this might affect the results of the paper. To add this mechanism, we would have to think carefully about who owns the capital in the economy. It seems safe to assume, for present purposes, that in underdeveloped economies capital is in the elite's hands.

[6]In Bourguignon and Verdier (2005), the authors make a similar argument in the context of trade integration and factor mobility.

both types of capital are complementary. Political participation in this model is linked to education, which means that the elite are willing to subsidize education despite the cost in terms of political power. With international financial integration, the return on investments of the capitalist is given by the international rate of interest, which breaks the complementarity between human capital and capital accumulation. The elite may stop subsidizing the education of the poor, which implies a reinforcement of their political power.[7] Notice the differences between their approach and mine. Their paper looks at how, for a given degree of inefficiency, political institutions change with trade.[8] My paper instead takes institutions as given and analyzes the change in their inefficiency. Also their paper is about whether trade delays or not democratization, not about the effects on Welfare.[9]

This paper is of course related to Segura-Cayuela (2006a), which shows empirical evidence on the relevance of the forces at play in the current paper.[10] This paper is also related to Epifani and Gancia (2005), who analyze the size of governments in the context of benevolent rulers that provide a public good. Because trade shifts part of the tax burden away, trade integration in such situations leads to higher taxation and bigger government. But the mechanics of their model are very different to mine. First, there is no distinction between good/bad political institution. Their analysis is about benevolent governments providing public goods. Also, taxation at home increases because foreigners pay some of it, through prices of imports. In my model taxation increases irrespective of who exports or imports. All it matters is that goods produced by the middle class can be found somewhere else. Finally, this paper is related also to the recent literature on the effect of trade in institutions, Levchenko (2004), Segura Cayuela (2006b), Do and Levchenko (2005), and chapter 10 on Acemoglu and Robinson (2005), among others.[11]

The rest of the chapter is organized as follows. Section 2 presents the basic economic

[7] Verdier (2005) provides a good discussion on how trade might affect domestic policy.

[8] By inefficiency in their model I mean the lack of financial markets.

[9] Of course democratization can have effects on Welfare. But there is no explicit discussion of the consequences in the context of their model. In their model, liberalizing financial markets slows human capital accumulation, but increases physical capital accumulation.

[10] In that paper I show evidence that expropriation increases with trade opening for non-democratic countries, while it is reduced for democratic ones, consistent with the main theoretical prediction of this paper.

[11] For the effects of institutions in trade/FDI, see for instance Levchenko(2004), Antràs (2003, 2005), or Antràs and Helpman (2005).

model and characterizes the economic and political equilibrium in a closed economy under a dictatorship of the elite. Section 3 repeats the exercises in Section 2, but for an open economy. Section 4 analyzes the welfare implications of opening to trade. Section 5 discusses how the analysis changes under a democracy. Finally Section 6 concludes.

1.2 The General Model with a Closed Economy

This section develops the basic economic model in a closed economy, where inefficiencies will arise due to limited checks on the executive power and the desire of the minority elite to extract rents from other groups in society. I will first solve for the economic equilibrium for a given set of policies, and then I will characterize the political equilibrium. I start by describing the general environment.

1.2.1 Environment

Consider an economy, closed to international trade for the time being, populated by a continuum of agents $1 + \theta^e + \theta^m$ that consume a single final good, y. Preferences of the agents are defined as

$$U = y.$$

The final good is produced by combining two intermediate inputs, y^e and y^m, according to technology

$$y = \beta^{-\beta}(1-\beta)^{-(1-\beta)} (y^e)^{\beta} (y^m)^{1-\beta}, \tag{1.1}$$

where I define $\chi \equiv \beta^{-\beta}(1-\beta)^{-(1-\beta)}$. There are three groups of agents. First, a mass 1 of workers, endowed with 1 unit of labor each, which they supply inelastically. Second, the middle class producers, denoted by m, who have access to production opportunities in sector m. Finally, the elite producers, e, who also have access to production opportunities in sector e and hold the political power.[12]

Technology is identical in both sectors,

[12]Most of the analysis in this paper would stand if I allowed both groups to produce in both sectors with different productivities. The assumption that they each perform in one of the sectors simplifies the discussion.

$$y_i^j = \frac{1}{1-\alpha}\left(k_i^j\right)^{1-\alpha}\left(l_i^j\right)^{\alpha}, \tag{1.2}$$

where y_i^j stands for production of individual i of group j, k denotes capital and l labor. Capital is assumed to fully depreciate after use.[13] In what follows, total variables for a group will simply be the value of that variable for an individual of that group, times the size of that group, j, θ^j.

The political power in this model will be in the hands of the elite.[14] They have the ability to decide policies and choose those that benefit them the most. The only policies in this model consist of the ability to tax the activity of both intermediate sectors with a rate τ^j. Again, we should interpret the concept of taxation in a broader sense: it could correspond to expropriation, or corruption, or any policy used by the elite to repress the middle class that translates into distortions in the economy.

Let us assume the following timing of events: first, taxes are set, then, investments are made. This way, we can abstract from inefficiencies due to hold-up problems, which could be interesting to analyze but are not the scope of this paper. Revenue from taxation can be distributed across groups with targeted lump-sum transfers towards each group, $T^j \geq 0$. The government budget constraint is

$$T^w + \theta^m T^m + \theta^e T^e \leq \phi \int_{j,i} \tau^j p^j y_i^j d_i d_j, \tag{1.3}$$

where p^j denotes the price of good j and ϕ is a parameter that measures the ability of the elite to collect and redistribute taxes, state capacity. In less-developed economies, fiscal systems are typically inefficient; this is due to large informal economies or corruption in the collection of taxes, for instance. So it should be natural to think that $\phi < 1$ for this type of economy: what the government redistributes is less than what it collects. For most of the analysis in this paper I will assume that this is the case, although I will discuss the results for $\phi = 1$ too. Notice that there are no other fiscal instruments, only distortionary taxes, which will be the root for the inefficiency of policies.

[13] A discussion of this assumption is found in Segura Cayuela (2006b).

[14] I assume that the elite producers hold the political power until I analyze the model in the context of a democracy. But for the analysis in this section, the economic equilibrium, who holds the political power will be irrelevant.

There is a maximum scale, $l^j \leq \lambda$, for each firm. And each member of a group can just set up one firm. The role of this assumption is to generate profits in equilibrium: if a group of producers reach their maximum scale, they will make profits. Notice that if

$$\lambda\theta^e + \lambda\theta^m < 1, \tag{1.4}$$

there is going to be excess labor supply in this economy, the total amount of labor that both groups demand is smaller than the supply of labor, 1. When Condition (1.4) holds, the wage rate will drop to 0. When it does not hold, we have excess demand for labor, which will give us a positive wage rate in equilibrium. Thus we can write labor market clearing as

$$\theta^m l_i^m + \theta^e l_i^e \leq 1, \tag{1.5}$$

where l_i^j will be the labor demand of an individual i of group j, and (1.5) is satisfied with equality when Condition (1.4) does not hold. Throughout the paper we analyze the results both when Condition (1.4) holds and when it does not, because that will allow me to separate the two sources of inefficiency.[15]

1.2.2 Economic Equilibrium in the Closed Economy

An economic equilibrium is a set of intermediate and final good prices, p, p^e, p^m, wage w, investment levels and employment levels for all producers $\{k^j, l^j\}_{j=e,m}$, such that given a set of taxes, τ^e, τ^m, and p, p^e, p^m, w, all producers choose investment and employment optimally, good markets clear, and labor market clears.

The problem for the final good producers is given by,

$$\underset{y^e, y^m}{Min}\ p^e y^e + p^m y^m \ s.t.$$
$$y \leq \chi \left(y^e\right)^{\beta} \left(y^m\right)^{1-\beta}.$$

[15]This will become clearer when we analyze the political equilibrium.

This minimization yields

$$\frac{y^e}{y^m} = \frac{\beta}{1-\beta}\frac{p^m}{p^e}, \tag{1.6}$$

Let us normalize $p = (p^e)^{\beta}(p^m)^{1-\beta} = 1$. Intermediate goods producers maximize profits taking the price and wage rate as given, which can be written as

$$\max \frac{(1-\tau^j)}{1-\alpha} p^j \left(k_i^j\right)^{1-\alpha} \left(l_i^j\right)^{\alpha} - w l_i^j - k_i^j, \tag{1.7}$$

where $j = e, m$. As there is no initial or final stock of capital, we are basically assuming that intermediate goods producers in each sector use units of final output to produce their goods. This implies that the price of capital is one, as it can be seen in (2.6). This problem yields

$$k_i^j = \left(p^j\left(1-\tau^j\right)\right)^{\frac{1}{\alpha}} l_i^j \tag{1.8}$$

$$l_i^j = \begin{cases} = 0 & \text{if } w > \frac{\alpha}{1-\alpha}\left((1-\tau^j)p^j\right)^{1/\alpha} \\ \in [0,\lambda] & \text{if } w = \frac{\alpha}{1-\alpha}\left((1-\tau^j)p^j\right)^{1/\alpha} \\ = \lambda & \text{if } w < \frac{\alpha}{1-\alpha}\left((1-\tau^j)p^j\right)^{1/\alpha} \end{cases} \tag{1.9}$$

Notice first in (1.9) that, whenever the marginal product of labor is smaller than the wage, the producer does not hire any workers. When the marginal product is bigger than the wage rate, a producer i of group j hires labor until reaching the maximum scale λ. It is also worth discussing the source of inefficiency in this economy. Looking at (1.8) we see that taxes discourage investment. This is because producers are only able to recover a fraction of what they invest.

We can replace (1.8) in (1.2) to find output for each individual of a group as a function of their labor demand,

$$y_i^j = \frac{1}{1-\alpha}\left(p^j\left(1-\tau^j\right)\right)^{\frac{1-\alpha}{\alpha}} l_i^j \tag{1.10}$$

and, using (1.10) together with (1.8), we can solve for the profits of each individual as a function of the price of that sector and the wage rate,

$$\pi_i^j = \left(\frac{\alpha}{1-\alpha}\left(p^j\left(1-\tau^j\right)\right)^{\frac{1}{\alpha}} - w\right) l_i^j. \tag{1.11}$$

For a given wage rate and employment, both output and profits will decrease with taxation because investment decreases. It will be useful to combine (1.10) with (2.5) to solve for the

relative price of the two sectors (where recall that $y^j = \theta^j y_i^j$),

$$\frac{p^e}{p^m} = \left(\frac{1-\tau^m}{1-\tau^e}\right)^{1-\alpha} \left(\frac{\beta}{(1-\beta)} \frac{\theta^m l_i^m}{\theta^e l_i^e}\right)^{\alpha}. \tag{1.12}$$

Most of the economic equilibrium has been already characterized. Because the implications for prices and wages of the model will differ, depending on whether there is full employment or not, we will analyze these two cases separately in the next subsections. I first analyze the equilibrium with excess labor supply and, in this case in which the wage rate drops to 0, firms will always make positive profits. When I analyze the equilibrium when the labor market clears we will describe two types of equilibria. First, one in which nobody makes profits because they do not reach the capacity constraint, and second, one in which one of the groups reaches the capacity constraint and makes profits. Who makes the profits, and when, will be a crucial question for the characterization of the political equilibrium.

The Economic Equilibrium with Excess Labor Supply

When Condition (1.4) holds, there is excess supply of labor in equilibrium and $w = 0$. Equation (1.11) reveals that producers in both sectors always have positive profits, leading them to hire the maximum amount of labor possible: $l^e = \lambda\theta^e$ and $l^m = \lambda\theta^m$. It is clear then that taxes do not affect relative labor demands by each group. This is the main difference with the full employment case, and we will discuss the role it plays for the political equilibrium in the following sections.

With relative labor demands constant, the only way taxes affect output and profits is through investment and prices. Once we take into account the equilibrium levels of employment, (1.12) translates into

$$\frac{p^e}{p^m} = \left(\frac{1-\tau^m}{1-\tau^e}\right)^{1-\alpha} \left(\frac{\beta}{(1-\beta)} \frac{\lambda\theta^m}{\lambda\theta^e}\right)^{\alpha}.$$

The interpretation of this relative price equation is straightforward. For given tax rates, when the ratio of the middle class' size relative to the size of the sector in which they produce, $\lambda\theta^m/(1-\beta)$, is larger than the same ratio for the elite, the relative price of the good produced by the elite increases. For given relative sizes, increased tax rates in the middle class sector lead to smaller investment, which translates into lower production and a higher relative price

for that good.

We can combine (1.12) with the price normalization to solve for the price levels as

$$p^e = \left(\frac{1-\tau^m}{1-\tau^e}\right)^{(1-\beta)(1-\alpha)} \left(\frac{\beta}{(1-\beta)}\frac{\lambda\theta^m}{\lambda\theta^e}\right)^{(1-\beta)\alpha} \tag{1.13}$$

$$p^m = \left(\frac{1-\tau^m}{1-\tau^e}\right)^{-\beta(1-\alpha)} \left(\frac{\beta}{(1-\beta)}\frac{\lambda\theta^m}{\lambda\theta^e}\right)^{-\beta\alpha}. \tag{1.14}$$

The next proposition summarizes the economic equilibrium when there is excess supply (proof in text):

Proposition 2 *When Condition* (1.4) *holds, for given taxes* τ^e *and* τ^m*, the economic equilibrium takes the following form: there is excess supply of labor,* $w = 0$*, and prices are given by* (1.13) *and* (1.14)*. Given prices and wage rates, investment, employment, and output in each sector are given by* (1.8)*,* (1.9) *and* (1.10)*, respectively.*

It is useful to derive profits for each group and total output in the economy for future reference. Replace (1.13) and (1.14) in (1.10), and then replace the resulting equation in (2.1) to find total output in the economy as

$$y = \frac{\chi\left(\lambda\theta^e\right)^{\beta}\left(\lambda\theta^m\right)^{1-\beta}}{1-\alpha}\left((1-\tau^e)^{\beta}(1-\tau^m)^{(1-\beta)}\right)^{(1-\alpha)/\alpha}. \tag{1.15}$$

Again, it is clear that taxation in each sector reduces investment in that sector, which translates into a reduction of total output. Profits for each group are derived by replacing (1.13) and (1.14) into (1.11), and taking into account that all producers reach the maximum scale,

$$\pi^e = \frac{\alpha\left(\lambda\theta^e\right)^{\beta}\left(\lambda\theta^m\right)^{1-\beta}}{1-\alpha}\left(\frac{\beta}{1-\beta}\right)^{(1-\beta)}(1-\tau^e)^{1/\alpha}\left(\frac{(1-\tau^m)}{(1-\tau^e)}\right)^{(1-\beta)(1-\alpha)/\alpha} \tag{1.16}$$

$$\pi^m = \frac{\alpha\left(\lambda\theta^e\right)^{\beta}\left(\lambda\theta^m\right)^{1-\beta}}{1-\alpha}\left(\frac{\beta}{1-\beta}\right)^{-\beta}\left(\frac{(1-\tau^e)}{(1-\tau^m)}\right)^{\beta(1-\alpha)/\alpha}(1-\tau^m)^{1/\alpha}. \tag{1.17}$$

A number of points are worth mentioning. First, because the wage rate drops to 0, both groups make profits. Second, as mentioned before, taxing a sector reduces profits of the producers in that sector. Finally, for any of the groups, a tax in the other group's sector reduces

their profits through its effect on the price. Taxing sector m makes the unit price of the consumption good more expensive, which decreases the real value of profits for the elite. As we have normalized the unit price to 1, this increase in the unit price translates into the price of sector e going down.

The Economic Equilibrium with Labor Market Clearing

The main difference in the case discussed in this section is that, as the labor market clears, differential tax rates across various sectors will affect the relative demand for labor in those sectors. To make profits, producers need to reach their maximum scale. Thus, the group that controls taxation -in this section the elite- can use taxes to modify relative demands and make profits in equilibrium. The more they turn relative demand in their favor, the less labor the other groups demand, which translates into lower factor prices and higher profits for the elite.

When Condition (1.4) does not hold, we can have two types of equilibria: one in which demand for goods produced by each group never exceeds what they can produce, and another in which one group reaches the maximum scale.[16] The type of equilibrium we have will depend, for given taxes, on the size of both groups. It will be important to understand when any of the groups reach their maximum scale, because that is what determines profits and what will determine taxation once we analyze the political equilibrium. For this reason, we first characterize the equilibrium when none of the producers reach the maximum scale.

In this case, given that producers are price-takers, they make no profits in equilibrium, which looking at (1.11) pins down price levels,

$$p^j = w^\alpha \left(\frac{1-\alpha}{\alpha}\right)^\alpha \frac{1}{(1-\tau^j)}, \tag{1.18}$$

and using this together with the price normalization we get the following expression for the wage rate,

$$w = \frac{\alpha}{1-\alpha}\left((1-\tau^e)^\beta (1-\tau^m)^{(1-\beta)}\right)^{1/\alpha}. \tag{1.19}$$

From (1.19) we see that the wage rate will depend on both tax rates. When the labor market

[16] Notice that because Condition (1.4) does not hold, we can never have both groups reaching the maximum scale at the same time.

clears, because both sectors are not perfect substitutes for each other, labor demands for each sector will depend on tax rates, and this feeds back into the wage rate. We can now combine the relative price equation (1.12) with the price levels (1.18) and the wage rate (1.19) to derive the equilibrium levels of employment in each sector, $l^j = \theta^j l_i^j$,

$$l^e = \frac{1}{1 + \frac{(1-\beta)(1-\tau^m)}{\beta(1-\tau^e)}}, \; l^m = \frac{1}{1 + \frac{\beta(1-\tau^e)}{(1-\beta)(1-\tau^m)}}. \tag{1.20}$$

We can see from (1.20) how taxes distort the relative allocation of resources between sectors. An increase in τ^e increases the relative price of good e, which decreases the relative demand for that good. In equilibrium, less labor will be allocated to that sector (and consequently less investment, as investment is proportional to labor), and more to sector m.

The equilibrium just derived holds as long as none of the groups reach their capacity constraint on labor. In particular, for this to be an equilibrium we need the equilibrium levels of employment to be smaller than the maximum scale for each group, $l^e \leq \lambda\theta^e$ and $l^m \leq \lambda\theta^m$. Combining these conditions with (1.20) we can express them as

$$\frac{1-\tau^m}{1-\tau^e} \geq \frac{\beta}{1-\beta}\frac{1-\lambda\theta^e}{\lambda\theta^e} \equiv \sigma(\beta, \theta^e) \tag{1.21}$$

$$\frac{1-\tau^m}{1-\tau^e} \leq \frac{\beta}{1-\beta}\frac{\lambda\theta^m}{1-\lambda\theta^m} \equiv \sigma(\beta, \theta^m) \tag{1.22}$$

where $\sigma(\beta, \theta^e) < \sigma(\beta, \theta^m)$ because Condition (1.4) does not hold. Notice that without taxation in this model the equilibrium level of employment in sectors e and m would be β and $(1-\beta)$ respectively. As long as $\lambda\theta^e \geq \beta$ and $\lambda\theta^m \geq (1-\beta)$, none of the groups would reach the maximum scale. With taxation, we have to take into account the distortion that taxation introduces in the allocation of resources across sectors. Equation (1.21) states that for the elite not to reach the maximum capacity, the equilibrium level of employment in sector e once we take into account the effect of taxation, has to be smaller than that capacity constrain. In other words, relative taxation has to more than compensate for the small capacity of the elite without taxation ($\beta/\lambda\theta^e$). The second condition states the same for the middle class.

Whenever (1.21) does not hold and (1.22) holds, the elite producers hit the capacity constraint and thus they make profits in equilibrium. When (1.22) does not hold and (1.21) is

satisfied, the opposite occurs. Notice that $\sigma(\beta, \theta^j)$ is just a measure of the size of the group relative to the size of the sector where they produce. If $\sigma(\beta, \theta^e) > 1$, that means that the elite producers are small relative to the size of their sector, and without taxation they would be constrained and make profits. If $\sigma(\beta, \theta^e) < 1$, they would not make profits unless taxation more than compensates for them being larger than the the sector in which they produce. We can summarize this result in the following Lemma (proof in text):

Lemma 3 *Assume Condition* (1.4) *does not hold. For given* $\sigma(\beta, \theta^e)$ *and* $\sigma(\beta, \theta^m)$, *where* $\sigma(\beta, \theta^e) < \sigma(\beta, \theta^m)$ *are defined in* (1.21) *and* (1.22), *if* $\sigma(\beta, \theta^e) < (1-\tau^m)/(1-\tau^e) < \sigma(\beta, \theta^m)$, *we have an equilibrium where no group reaches the maximum scale. Whenever* $(1-\tau^m)/(1-\tau^e) < \sigma(\beta, \theta^e)$, *then the elite producers are capacity constrained and make profits in equilibrium, and the middle class producers do not, as they do not reach the maximum scale. Finally, when* $\sigma(\beta, \theta^m) < (1-\tau^m)/(1-\tau^e)$, *the middle class producers are capacity constrained and make profits in equilibrium, while the elite do not.*

We proceed now to analyze the determination of prices and wages when a group reaches its maximum scale. To avoid repetition because of the symmetric structure, let us analyze the case in which the elite producers are constrained, and summarize the results for the other case at the end of this section.

If Condition (1.4) does not hold, then for the labor market to clear it has to be the case that

$$w = \min_j \left[\frac{\alpha}{1-\alpha} \left((1-\tau^j) p^j \right)^{1/\alpha} \right]. \tag{1.23}$$

The reason is that if both producers are making profits, total labor demand would be $\lambda\theta^e + \lambda\theta^m > 1$, and we would have excess demand for labor which pushes the wage level up, until one of the groups is making no profits in equilibrium. Equation (1.23) automatically pins down the price level for the producer with no profits. Denote as $p^{j'}$ the price of the good in the sector where producers make no profits. Then

$$p^{j'} = \left(w \frac{1-\alpha}{\alpha} \right)^{\alpha} \frac{1}{1-\tau^{j'}}. \tag{1.24}$$

Equation (1.24) determines the price in sector m,

$$p^m = w^\alpha \left(\frac{1-\alpha}{\alpha}\right)^\alpha \frac{1}{(1-\tau^m)}. \tag{1.25}$$

The elite producers, because marginal product of labor is above the wage rate, hire as much labor as they can, which leaves the rest of the labor force for the middle class to produce in sector m, $l^e = \lambda\theta^e$ and $l^m = 1 - l^e = 1 - \lambda\theta^e$. We can combine this together with the expression for the relative price, (1.12), and the price level in sector m, (1.25), to solve for the price of sector e as

$$p^e = \left(\sigma(\beta,\theta^e)\frac{(1-\tau^e)}{(1-\tau^m)}\right)^\alpha w^\alpha \left(\frac{1-\alpha}{\alpha}\right)^\alpha \frac{1}{(1-\tau^e)}. \tag{1.26}$$

The equilibrium wage rate can be found again by combining (1.25), (1.26), and the price normalization ,

$$w = \frac{\alpha}{1-\alpha}\left((1-\tau^e)^\beta(1-\tau^m)^{(1-\beta)}\right)^{1/\alpha}\left(\sigma(\beta,\theta^e)\frac{(1-\tau^e)}{(1-\tau^m)}\right)^{-\beta} \tag{1.27}$$

Whenever the middle class producers are constrained and the elite producers are not, we are going to have $l^e = 1 - \lambda\theta^m$ and $l^m = \lambda\theta^m$, and the derivation of the prices and the wage rate is symmetrical to the case just analyzed. The solution is given by

$$\begin{aligned} p^e &= w^\alpha \left(\frac{1-\alpha}{\alpha}\right)^\alpha \\ p^m &= \left(\frac{1-\tau^m}{1-\tau^e}\frac{1}{\sigma(\beta,\theta^m)}\right)^\alpha w^\alpha \left(\frac{1-\alpha}{\alpha}\right)^\alpha \frac{1}{(1-\tau^m)} \\ w &= \frac{\alpha}{1-\alpha}\left((1-\tau^e)^\beta(1-\tau^m)^{(1-\beta)}\right)^{1/\alpha}\left(\sigma(\beta,\theta^m)\frac{(1-\tau^e)}{(1-\tau^m)}\right)^{1-\beta} \end{aligned} \tag{1.28}$$

We can see how the general equilibrium makes the price in a sector depend on the tax in the other sector. When none of the groups reach the maximum scale, the effect is only through labor market clearance, as described before. When a group is constrained, any taxation in the other group also feeds back into the price through another channel; a tax in the other group increases the constrained group's relative demand and because they are constrained, quantity does not adjust. So for the intermediate goods market to clear the price of their good has to increase. We are ready now to summarize the results in Proposition 2 (proof in text):

Proposition 4 *For given taxes τ^e and τ^m, when Condition* (1.4) *does not hold, the economic equilibrium takes the following form: For $\sigma(\beta,\theta^e) < (1-\tau^m)/(1-\tau^e) < \sigma(\beta,\theta^m)$ none of the groups are constrained by the maximum scale and the wage rate and prices are given by* (1.19) *and* (1.18). *For $\sigma(\beta,\theta^e) < (1-\tau^m)/(1-\tau^e)$, the elite producers reach the maximum scale, and the wage rate and prices are given by* (1.25) (1.26) *and* (1.27). *Finally for $(1-\tau^m)/(1-\tau^e) > \sigma(\beta,\theta^m)$, the middle class producers reach the capacity constraint, and the wage rate and prices are given by* (1.28). *Given prices and wage rates, investment employment and output in each sector are given by* (1.8), (1.9) *and* (1.10).

Again, it will be useful to derive total output and profits for each group for future reference. Proceeding as before we have

$$y = \frac{\chi\left(\lambda\theta^{e\beta}\right)(1-\lambda\theta^e)^{1-\beta}}{1-\alpha}\left((1-\tau^e)^\beta(1-\tau^m)^{(1-\beta)}\right)^{(1-\alpha)/\alpha} \text{ for } \frac{(1-\tau^m)}{(1-\tau^e)} < \sigma(\beta,\theta^e) \quad (1.29)$$

$$y = \frac{1}{1-\alpha}\frac{\left((1-\tau^e)^\beta(1-\tau^m)^{(1-\beta)}\right)^{1/\alpha}}{(1-\tau^e)^\beta\beta+(1-\tau^m)(1-\beta)} \qquad \text{for } \sigma(\beta,\theta^e) < \frac{(1-\tau^m)}{(1-\tau^e)} < \sigma(\beta,\theta^m) \quad (1.30)$$

$$y = \frac{\chi(1-\lambda\theta^m)^\beta(\lambda\theta^m)^{1-\beta}}{1-\alpha}\left((1-\tau^e)^\beta(1-\tau^m)^{1-\beta}\right)^{(1-\alpha)/\alpha} \text{ for } \sigma(\beta,\theta^m) < \frac{(1-\tau^m)}{(1-\tau^e)}$$

The elite producers only make profits whenever they reach the maximum scale, so profits are

$$\pi^e = \frac{\theta^e\lambda}{\sigma(\beta,\theta^e)^\beta}\frac{\alpha}{1-\alpha}\left[\sigma(\beta,\theta^e)(1-\tau^e)-(1-\tau^m)\right]\times \quad (1.31)$$
$$\left((1-\tau^e)^\beta(1-\tau^m)^{(1-\beta)}\right)^{(1-\alpha)/\alpha} \text{ for } \frac{(1-\tau^m)}{(1-\tau^e)} < \sigma(\beta,\theta^e)$$

In this section we have characterized the economic equilibrium. With excess labor supply, both groups make profits in equilibrium, but when the labor market clears the relative taxation on both sectors will determine who makes the profits. This immediately implies that groups with political power, by setting relative taxation, will be able to manipulate the relative allocation of resources in order to increase their profits. This will be important when discussing the political equilibrium.

1.2.3 Political Equilibrium under the Dictatorship of the Elite

I will now characterize the political equilibrium of this economy. I assume that political institutions correspond to a dictatorship of the elite, and the elite producers can choose those policies that benefit them the most. The only variables of choice for the government are the tax rates. As discussed previously, this can be interpreted in a broader sense. We may think of taxes also as expropriation, corruption, or other inefficient policies that translate into less investment and/or higher prices. Taxation is distortionary and there are no other means (in particular, no lump-sum taxes) to extract resources from the other producers. The existence of these policies does not imply that the elite will, necessarily, take advantage of them. But, in our model, the elite will want to tax other producers for two reasons: first, they may tax the middle class to extract revenues from them (Revenue Extraction), which is a direct benefit from taxation. Second, they may seek to benefit through an indirect channel: by taxing other groups with production activities, they reduce the demand for factors of these groups and benefit themselves through lower factor prices and higher profits (Factor Price Manipulation).

A political equilibrium is a set of policies $\{\tau^e, \tau^m, T^w, T^m, T^e\}$ that satisfies the budget constraint for the government, (2.4), and maximizes the elite's utility. Given the linear preferences, this translates into maximizing total income, where income of the elite is defined as the sum of profits and the transfer,

$$I^e = \pi^e + T^e, \tag{1.32}$$

It is straightforward to see that the elite will redistribute all of the revenues from taxation to themselves, so $T^w = T^m = 0$. Using this together with the government budget constraint, (2.4), the problem for the elite reduces to

$$\underset{\tau^e,\tau^m}{Max}\ \phi(\tau^e p^e y^e + \tau^m p^m y^m) + \pi^e$$

and combining this with the relative demands, (2.5), it translates into

$$\underset{\tau^e,\tau^m}{Max}\ \phi y(\beta\tau^e + (1-\beta)\tau^m) + \pi^e. \tag{1.33}$$

To make the analysis as clear as possible and to emphasize the different sources of inefficiency,

I analyze each of these sources separately by restricting the set of parameters.[17]

1.2.4 Revenue Extraction

In this section, let us assume there is excess labor supply; i.e., Condition (1.4) holds. With this assumption, we remove Factor Price Manipulation as a possible source of taxation-induced inefficiency. Wages are now 0 and unaffected by taxation, so the elite rulers do not have an incentive to tax to increase profits. But this by itself will not remove all the effect of taxation on profits, as profits will depend on both levels of taxation through the price levels and the general equilibrium. Assume also that $\phi > 0$: the elite has enough state capacity to redistribute taxation to themselves.

We can combine equations (1.33), (1.15), and (1.16) to write the elite's problem as

$$\underset{\tau^m,\tau^e}{Max} \frac{\chi\left(\lambda\theta^e\right)^{\beta}\left(\lambda\theta^m\right)^{1-\beta}}{1-\alpha}\left((1-\tau^e)^{\beta}(1-\tau^m)^{(1-\beta)}\right)^{(1-\alpha)/\alpha} \times \left(\phi\left(\beta\tau^e+(1-\beta)\tau^m\right)+\alpha\beta(1-\tau^e)\right).$$

The solution to this problem (see the appendix for the details) is

$$\begin{aligned} \tau^e_{RE} &= 0 \\ \tau^m_{RE} &= Max\left[0, \frac{\alpha\left(\phi-\beta(1-\alpha)\right)}{\phi(1-\beta(1-\alpha))}\right], \end{aligned}$$

where RE stands for Revenue Extraction. This is straightforward to interpret. The elite producers never want to tax themselves. Taxing themselves has two opposite effects. First, the only benefit is that elite producers get all the revenues from taxation. But this increases the price of the goods they produce, and it reduces their profits. Without considering profits, the elite would want to tax themselves, as they get all the revenue and they only suffer part of the price increase (they only consume a fraction of what they produce). But the additional effect of a reduction in profits dominates and, therefore, they never tax themselves in equilibrium.

[17]The general case with both forces at play at the same time does not provide more insights than those in here and it complicates the analysis.

Notice the impact of taxing the middle class on the elite's profits through the general equilibrium effect. Taxing the middle class makes their goods more expensive, which reduces the real value of the elite's profits. When the elite's motivation to tax comes from Revenue Extraction they would like to set a tax rate on the middle class that places them at the peak of the Laffer Curve, $\tau^m = \alpha$. But this must be weighed against the commensurate reduction in the elite's profits through the general equilibrium. Only when the Resource Extraction motive for taxing is strong enough to compensate for the general equilibrium effect will we have $\tau^m_{RE} > 0$. Thus, the general equilibrium limits the extent to which the elite can expropriate the middle class.

Also, notice that taxation in the middle class sector increases as ϕ increases, and in particular, when the Resource Extraction motive has its biggest importance, $\phi = 1$, $\tau^m_{ES} = \alpha$. Larger state capacity helps overcome the general equilibrium effect, and when state capacity is at its maximum level, the elite are able to set their most desired tax rate. Taxation is also increasing with α. The larger α is, the less distortion taxation creates, which leads to a bigger tax rate. Additionally, the larger the size of the sector where the elite produce, β, the smaller taxation on the middle class sector is. This is because a larger β makes profits more important as a source of income for the elite, exacerbating the general equilibrium effect.

The following Proposition summarizes these findings,

Proposition 5 *When Condition* (1.4) *holds and* $\phi > 0$, *the unique political equilibrium features* $\tau^e_{RE} = 0$ *and* $\tau^m_{RE} = Max\left[0, \frac{\alpha(\phi-\beta(1-a))}{\phi(1-\beta(1-\alpha))}\right]$ *and the equilibrium tax rate for sector m increases with* α *and* ϕ, *and decreases with* β.

Proof. See Appendix ■

1.2.5 Factor Price Manipulation

So far, we have analyzed the political equilibrium when the only source of inefficiency was Revenue Extraction. Let us develop the opposite scenario. In this section we assume that $\phi = 0$. Remember, ϕ reflects the ability of the elite to collect and redistribute taxes. When $\phi = 0$, everything that is collected is lost: the elite receive no direct benefit from taxation. Their only profit, then, comes from production activities. The elite thus need to be reaching

their maximum scale in the production of good e. From Proposition 1 we know that this is going to be the case as long as $(1-\tau^m)/(1-\tau^e) < \sigma(\beta,\theta^e)$.

When the elite producers are capacity constrained, profits are going to be given by (1.31). In this case it is clear that the elite will never tax themselves, as taxing themselves has only the negative effect on profits, directly and through the wage rate. The problem for the elite can then be written as

$$\underset{\tau^m}{Max} \frac{\theta^e \lambda}{\sigma(\beta,\theta^e)^\beta} \frac{\alpha}{1-\alpha} \left[\sigma(\beta,\theta^e) - (1-\tau^m)\right] (1-\tau^m)^{(1-\beta)(1-\alpha)/\alpha}$$
$$s.t.\ (1-\tau^m) < \sigma(\beta,\theta^e).$$

Notice first that the profit margin now depends on the tax rate on the middle class. The reason is that in this type of equilibrium, demand for labor in sector e (and supply of good e) is totally inelastic because the elite producers are reaching their capacity constraint. Any decrease in $(1-\tau^m)$, which leads to an increase in relative demand of good e, translates into an increase in the price of good e. From this point of view, the elite would want to tax sector m as much as possible. But the general equilibrium effect will stop them from doing so. The restriction just captures the fact that the elites need to be in the region where they have positive profits to have income.

The *F.O.C.* of this problem is

$$-\frac{(1-\beta)(1-\alpha)}{\alpha} \frac{\pi^e}{(1-\tau^m)} + \frac{\pi^e}{[\sigma(\beta,\theta^e) - (1-\tau^m)]} = 0,$$

and we can rewrite this as

$$(1-\tau^m) = \sigma(\beta,\theta^e) \frac{(1-\beta)(1-\alpha)}{\alpha + (1-\beta)(1-\alpha)}$$

We will have positive taxation as long as $\sigma(\beta,\theta^e) < ((1-\beta)(1-\alpha)+\alpha)/(1-\beta)(1-\alpha)$: if the size of the elite relative to the size of the sector where they produce is small ($\sigma(\beta,\theta^e)$ large), the elite producers will make profits even without taxation. There is no need for the elite to tax the middle class, and they will choose not to do so because taxing reduces profits through the general equilibrium effect. For the elite to tax the middle class, the elite producers have to

be large enough relative to the size of the sector where they produce.

When this is the case, τ^m depends positively both on α and $\lambda\theta^e$. A big $\lambda\theta^e$ means that the elite will have excess capacity without taxation. The bigger $\lambda\theta^e$ is, the higher is the required tax on the middle class for the elite to make profits. A higher α implies that the distortion in investment is going to have a small effect because the weight of capital in the production of goods is small, which allows the elite to set higher taxes. Finally, the effect of β is also negative. An increase in β decreases the weight of sector m in the price level and consequently in the wage rate. Distorting p^m is going to have a smaller effect in the wage rate in equilibrium which tends to increase the desired tax rate on the middle class. Increasing β, however, reduces the necessity of taxing in order to make profits through $\sigma(\beta, \theta^e)$, and this effect dominates the first one. We summarize the results in the next Proposition (proof in text):

Proposition 6 *When Condition* (1.4) *does not hold and* $\phi = 0$, *the unique political equilibrium features* $\tau^e_{FPM} = 0$ *and* $\tau^m_{FPM} = Max\left[0, 1 - \sigma(\beta, \theta^e)\frac{(1-\beta)(1-\alpha)}{\alpha+(1-\beta)(1-\alpha)}\right]$ *and the equilibrium tax rate for sector* m *increases with* α *and* $\lambda\theta^e$ *and decreases with* β.

Again we see how the general equilibrium effect works as a limit on the extent to which the elite can expropriate the middle class. Without it, the elite would want to tax as much as possible. And notice that without tax revenues there is no Laffer Curve. Without general equilibrium effect the elite would want to fully expropriate the middle class. But because the real value of their profits decreases with taxation in the other sector, they will only tax whenever it is strictly necessary; that is, when they have excess capacity.

Which source of inefficiency, Revenue Extraction or Factor Price Manipulation, leads to higher taxes depends on the size of the elite as a group. When the source of inefficiency is Revenue Extraction, the tax rate is the same no matter what the size of the elite is. For Factor Price Manipulation, Proposition 4 states that the tax rate increases with the size of the elite. In particular, notice that when $\lambda\theta^e = \beta$ ($\sigma(\beta, \theta^e) = 1$), $\tau^m_{FPM} = \alpha/(\alpha+(1-\beta)(1-\alpha)) > \alpha \geq \tau^m_{RE}$. Also, we discussed earlier that for $\lambda\theta^e << \beta$ ($\sigma(\beta, \theta^e) >> 1$), $\tau^m_{FPM} = 0 \leq \tau^m_{RE}$. Thus Factor Price Manipulation will generate higher taxation when the elite producers are big as a group because they would have excess capacity without taxation, and the bigger the excess capacity they have, the more they need to tax to distort demands in order to make profits.

The key for the results in the political equilibrium is that the elite producers not only set policies but also take part in production activities, which allow them to make profits. Because they make profits, they want to tax the middle class more than themselves. But taxing asymmetrically distorts the allocation of resources across sectors and, as a consequence, taxing the middle class not only reduces total tax revenues (the Laffer Curve effect) but also reduces the elite's profits as the relative price of their goods decreases fast with taxation. This restrains the elite from taxing the middle class too much.

1.3 Opening the Economy to International Trade

This section modifies the previous framework by allowing international trade in intermediate goods. The main result will be that, as trade removes the general equilibrium effect that distorting the relative price has on the elite's profits, expropriation/taxation will increase with increased trade integration.

I assume a small open economy that has access to world markets for goods m and e. These goods sell at prices p^{e*} and p^{m*}, and are produced with the same technologies in the rest of the world. We assume the forces relevant in the small open economy do not apply for the rest of the world: with both sectors using the same technology and no scarce "factors" it is clear that both intermediate goods will sell at the same price in world markets. And because we have normalized the unit price for the consumption bundle to one, this immediately implies that the price for both intermediate goods will be one and employment in each sector will be β and $1-\beta$.[18]

It will be useful to discuss the source for gains derived from trade in the context of this model without expropriation. If one group of producers is small relative to the size of the other, the goods they produce are very expensive in the closed economy: the relative price for that good is greater than one, and opening to trade will allow others to buy those goods at lower prices. Benefits from trade for this economy derive from the relative scarcity of the groups, or, in other words, the relative abundance of a group in our economy provides them

[18]By normalizing the relative price of intermediate sectors to 1 for the rest of the world I abstract from any source of comparative advantage, other that the difference on tax rates. This allows for a cleaner discussion of the main result of the paper.

with comparative advantage in the production of that good. This is a simplification, as we could think of the size of both groups as incorporating differences in productivity as well, and then talk about comparative advantage in terms of effective endowments of social groups.

Let us proceed by first solving for the economic equilibrium for a given set of policies, and then move on to characterizing the political equilibrium.

1.3.1 Economic Equilibrium with Trade

Most of the derivations from Section 2 are valid in this Section; to avoid repetition, we will simply emphasize what is new. For clarity of exposition, I will derive the equilibrium for p^{e*} and p^{m*} and simply replace them with one whenever is needed to discuss results.

When Condition (1.4) holds we have an excess supply of labor at home and wages will again drop to 0, which means that for any price level in the world market and any domestic tax level both groups produce and make profits. Given that the wage rate drops to 0 all producers hire labor until reaching the maximum scale. Replacing the price levels in (1.10), the levels of output in each sector are

$$y^e = \frac{1}{1-\alpha}\left(p^{e*}\left(1-\tau^e\right)\right)^{\frac{1-\alpha}{\alpha}}\lambda\theta^e \tag{1.34}$$

$$y^m = \frac{1}{1-\alpha}\left(p^{m*}\left(1-\tau^m\right)\right)^{\frac{1-\alpha}{\alpha}}\lambda\theta^m. \tag{1.35}$$

where we already have replaced for the employment levels. Notice that output in sector j only depends on taxation in sector j. This is the result of two things. First, excess supply of labor removes any effect of taxation on the wage rate. Second, because prices are set outside the domestic economy, relative taxation does not affect relative prices.

For future reference and proceeding as in the closed economy, total profits for each group are

$$\pi^e = \left(\frac{\alpha}{1-\alpha}\left(p^{e*}\left(1-\tau^e\right)\right)^{\frac{1}{\alpha}}\right)\lambda\theta^e \tag{1.36}$$

$$\pi^m = \left(\frac{\alpha}{1-\alpha}\left(p^{m*}\left(1-\tau^m\right)\right)^{\frac{1}{\alpha}}\right)\lambda\theta^m, \tag{1.37}$$

where again, profits in sector j only depend on taxation in sector j.

If Condition (1.4) does not hold, it will still be the case that prices will not depend on taxation, but wages will. In particular for given prices and taxes, the wage rate has to clear the labor market, and will be given by (1.23). If we denote with j' the group with the minimum $(1-\tau^j)p^{*j}$, that is, the group with no profits in equilibrium, the economic equilibrium with trade is as follows: the other group, j, has profits in equilibrium and reaches the maximum scale, $l^j = \lambda\theta^j$, while group j' hires the rest of the labor, $l^{j'} = 1 - \lambda\theta^j$, so levels of output in each sector are

$$y^j = \frac{1}{1-\alpha}\left(p^{j*}\left(1-\tau^j\right)\right)^{\frac{1-\alpha}{\alpha}}\lambda\theta^j \tag{1.38}$$

$$y^{j'} = \frac{1}{1-\alpha}\left(p^{j'*}\left(1-\tau^{j'}\right)\right)^{\frac{1-\alpha}{\alpha}}(1-\lambda\theta^j). \tag{1.39}$$

and total profits for each group are

$$\begin{aligned}\pi^j &= \left(\frac{\alpha}{1-\alpha}\left(p^{j*}\left(1-\tau^j\right)\right)^{\frac{1}{\alpha}} - w\right)\lambda\theta^j \\ \pi^{j'} &= 0\end{aligned} \tag{1.40}$$

Let us describe the pattern of export/imports in this model. Total domestic consumption of each intermediate good is given by

$$p^{e*}c^e = \beta(p^{e*}y^e + p^{m*}y^m) \tag{1.41}$$

$$p^{m*}c^m = (1-\beta)(p^{e*}y^e + p^{m*}y^m, \tag{1.42}$$

where we use c^j to differentiate aggregate consumption of good j from aggregate production of that good. A country is a net exporter of good j if $p^{j*}c^j < p^{j*}y^j$, which implies that the domestic economy is a net exporter of good e (importer of good m) if $(1-\beta)p^{e*}y^e > \beta p^{m*}y^m$. In the case of excess labor supply this translates into

$$\frac{p^{e*}}{p^{m*}} > \left(\frac{1-\tau^m}{1-\tau^e}\right)^{1-\alpha}\left(\frac{\beta}{(1-\beta)}\frac{\lambda\theta^m}{\lambda\theta^e}\right)^{\alpha},$$

and, with full employment and assuming that the elite producers are the ones with profits

(which will be the case in equilibrium), this translates into

$$\frac{p^{e*}}{p^{m*}} > \left(\frac{1-\tau^m}{1-\tau^e}\right)^{1-\alpha}\left(\frac{\beta}{(1-\beta)}\frac{1-\lambda\theta^e}{\lambda\theta^e}\right)^{\alpha}.$$

Notice that in both cases the right-hand side of the equation corresponds to a measure of relative employment in each sector adjusted by the distortions that taxation creates on relative productivity. If the middle class is larger relative to the size of their sector compared with the elite (and adjusted by relative taxation), the country has a comparative advantage in the production of that good and consequently it will be a net exporter of that good. If we did not have either taxation or capacity constraints in this model, the relative price of the two sectors in equilibrium would be one because both sectors use the same technology. But because there are capacity constraints, the size of the groups determines comparative advantage. The next Proposition summarizes the results (proof in text):

Proposition 7 *For a small open economy, for given taxes τ^e and τ^m, and world prices for intermediate goods, p^{e*} and p^{m*}, the economic equilibrium takes the following form: When Condition* (1.4) *holds, there is excess supply of labor and wages drop to 0. When Condition* (1.4) *does not hold, the wage rate is given by* (1.23). *Given prices and wage rates, investment employment and output in each sector are given by* (1.8), (1.9) *and* (1.10).

Notice that an increase in the taxation on the middle class will reduce their investment and production but it will not affect the prices in the elite's sector, and thus it will not affect their production. Now that the country has access to these goods in foreign markets, taxation policy will not affect the real value of the elite's profits. The distortion will affect exports and imports: first, production by the middle class decreases, and second, consumption in the domestic economy decreases as a consequence of the decrease in total income. If the elite are exporting their good, they can compensate for the decrease in the middle class' demand by exporting more abroad and importing more of the other goods. If the economy is a net importer for the elite's good, an increase in taxation on the middle class will induce fewer exports of good m and less imports of good e.

1.3.2 Political Equilibrium with Trade

We have seen how the general equilibrium effect was limiting the elite from taking full advantage from taxation on the middle class sector. When the economy is open to trade this will not necessarily be the case. As discussed in the Introduction, the key difference between a closed and an open economy is that, in the latter, taxation in both sectors is no longer linked through the general equilibrium (other than through the wage rate). Prices in one sector do not depend on taxation in the other. This observation drives the principal finding of this paper: trade increases the inefficiency of political institutions with limited checks on the executive power because it removes the general equilibrium effects that prevent the elite from extracting too much rents in a closed economy.

We proceed now to describe the political equilibrium as in the closed economy, by analyzing each source of inefficiency separately.

Revenue Extraction

Proceeding as before, assume that Condition (1.4) holds so that we isolate the Revenue Extraction source of inefficiency. Assume also that $\phi > 0$. The elite's problem is now

$$\underset{\tau^m,\tau^e}{Max}\phi \frac{\tau^e}{1-\alpha}\left(p^{e*}\right)^{\frac{1}{\alpha}}\left(1-\tau^e\right)^{\frac{1-\alpha}{\alpha}}\lambda\theta^e + \left(\frac{\alpha}{1-\alpha}\left(p^{e*}\left(1-\tau^e\right)\right)^{\frac{1}{\alpha}}\right)\lambda\theta^e + \phi\frac{\tau^m}{1-\alpha}\left(p^{m*}\right)^{\frac{1}{\alpha}}\left(1-\tau^m\right)^{\frac{1-\alpha}{\alpha}}\lambda\theta^m.$$

This returns to the main point. The elite's profits no longer depend on taxation in sector m, because opening to trade removes the general equilibrium effect. The first order condition with respect to τ^e is always negative: the elite producers never want to tax themselves. Given that the solution to this problem is straightforward, income of the elite is maximized when $\tau^m_{RE,T} = \alpha$ where T stands for trade. The elite tax the middle class at the peak of the Laffer Curve, because taxing sector m does not affect the value of their profits. In the closed economy, this was not the case. The elite could not tax the middle class too much because good m was produced exclusively by the middle class, and excessive taxation meant increasing the price of the consumption good, which meant a reduction in the real value of the elite's profits. With trade, taxation affects trade volumes instead of relative prices, since the domestic economy

now can find those goods in the world's markets. Opening to trade increases inefficiency by increasing substitutability between the elite's and the middle class' sectors.

The only case in which this is not true is when the rulers have maximum state capacity; i.e., $\phi = 1$. In the closed economy, the elite behaves as if there was no general equilibrium effect when $\phi = 1$, because the gains of taxing at the peak of the Laffer Curve more than outweigh the losses of the general equilibrium effect. The following Proposition summarizes this result (proof in text):

Proposition 8 *For a small open economy, given world prices for intermediate goods, p^{e*} and p^{m*}, the unique political equilibrium when the source of inefficiency is Revenue Extraction features $\tau^m_{RE,T} = \alpha$. Trade weakly increases taxation/inefficiency.*[19]

Factor Price Manipulation

Assume now that there is no Revenue Extraction motive for taxation, $\phi = 0$ and Condition (1.4) does not hold. Then the elite producers only care about profits and their problem becomes

$$\underset{\tau^m}{Max}\ \pi^e = \left(\frac{\alpha}{1-\alpha} p^{e*\frac{1}{\alpha}} \left(1-\tau^e\right)^{\frac{1-\alpha}{\alpha}} - w\right) \lambda\theta^e,$$

with the wage rate defined as in (1.23). Notice from the wage equation (1.23) that the elite will only make profits if $\left(p^{e*}\left(1-\tau^e\right)\right)^{\frac{1}{\alpha}} < \left(p^{m*}\left(1-\tau^m\right)\right)^{\frac{1}{\alpha}}$. In other words, the elite has to tax middle class enough to make the value of their labor productivity greater than that of the middle class. If the elite tax themselves, it becomes harder for them to make profits and it reduces profits when they have them. So, they forego doing so. The elite will tax the middle class in order to reduce the middle class' labor productivity to less than their own. But now there is no general equilibrium effect stopping the elite from pushing taxation even higher. So, it is clear that in this case the elite is going to tax the middle class as much as they can, dropping the wage rate to 0, $\tau^m_{FPM,T} = 1$.[20] Again, opening to trade exacerbates policy inefficiencies by removing the moderating power of the general equilibrium effect. The results for the political

[19] *"Weakly" just reflects that in the case with $\phi = 1$ inefficiency does not change.*

[20] Taxing the middle class at the highest rate is highly inefficient, and this result comes directly from assuming $\phi = 0$. As long as $\phi > 0$, since labor demand will shift from one sector to the other, the tax rate on the middle class will never go to 1.

equilibrium are summarized in this Proposition (proof in text):

Proposition 9 *For a small open economy, given world prices for intermediate goods, p^{e*} and p^{m*}, the unique political equilibrium when the source of inefficiency is Factor Price Manipulation features $\tau^m_{FPM,T} = 1$. Trade increases taxation/inefficiency*

The intuition behind this increased inefficiency is the same than before: access to foreign markets allows the elite to find what the middle class produces somewhere else. Because of this, taxing the middle class does not affect the real value of the elite's profits and they are free to extract as much rent as they desire. With trade, inefficiency increases through an increase in expropriation and the distortions that this increased expropriation creates on investment.

That the effects of taxation on prices disappear with trade is specific to the small open economy case. But the main result would remain consistent. Trade increases competition and, through that, it increases the substitutability between domestic sectors, which increases the incentives of the group in power to extract rents from other groups.

1.4 Welfare Analysis

In this section, I analyze the winners and losers in this process of trade integration. The results will be a balance between two effects. First, as shown in Propositions 6 and 7, trade increases expropriation and this will benefit the group in power, while damaging everyone else. Second, trade benefits the group that is relatively abundant in the economy, as it increases the price of that good with respect to the closed economy. I will characterize when it is the case that one effect dominates the other for each group. Finally, for the country to win with trade, winners have to win more than losers lose; in this context, due to the increased expropriation after trade, this is not necessarily the case. The conditions for when this is the case will be derived in this section.

For the rest of the paper, let us replace $p^{e*} = p^{m*} = 1$. Comparing welfare will be reduced to comparing income levels, because preferences are linear. Total income in the economy is given by

$$W = w + \pi^e + \pi^m + T^e,$$

that is, total profits for each group, transfers, and the wage from the workers. Let me again proceed by separating the analysis in two parts, one for each source of inefficiency.

1.4.1 Revenue Extraction

The first thing to point out is that when Revenue Extraction is the only source of inefficiency workers will not be affected by trade opening, as in both cases wages will be 0. Total welfare before and after trade is then

$$W_{RE} = \pi^{e}_{RE} + \phi\tau^{m}_{RE}p^{m}_{RE}y^{m}_{RE} + \pi^{m}_{RE}$$

$$W_{RE,T} = \pi^{e}_{RE,T} + \phi\tau^{m}_{RE,T}p^{*m}_{RE,T}y^{m}_{RE,T} + \pi^{m}_{RE,T},$$

where the first two terms are profits and taxation that go to the elite and the third term are profits of the middle class. Let me look first at what would happen in this model without taxation. Both the middle class and the elite make profits before and after trade. Who wins and who loses with trade depends on whose profits go up. Taking the expression for profits and eliminating taxation from them we see that the elite producers win with trade if

$$\left(\frac{\lambda\theta^{m}}{\lambda\theta^{e}}\right) < \frac{\beta}{1-\beta},$$

and the middle class wins if this condition does not hold,

$$\left(\frac{\lambda\theta^{m}}{\lambda\theta^{e}}\right) > \frac{\beta}{1-\beta}$$

This is straightforward to interpret. Before trade prices are determined by relative abundance of each group, so the group that is more abundant has smaller profits. Opening to trade implies that the price for the abundant group goes up while the price for the scarce group goes down.

Let us look now at what happens in our model once we incorporate taxation. Proposition 8 summarizes the results.

Proposition 10 *When Revenue Extraction is the source of inefficiency and the economy opens to trade, workers are unaffected. The middle class wins with trade whenever* $\left(\frac{\lambda\theta^{m}}{\lambda\theta^{e}}\right) > \left(\widehat{\frac{\lambda\theta^{m}}{\lambda\theta^{e}}}\right)$,

where $\left(\widehat{\frac{\lambda\theta^m}{\lambda\theta^e}}\right) > \frac{\beta}{1-\beta}$ *is defined in* (1.43) *(Appendix). The elite producers win with trade whenever* $\frac{\lambda\theta^m}{\lambda\theta^e} < \frac{\lambda\theta^m}{\underleftrightarrow{\lambda\theta^e}}$, *and* $\frac{\lambda\theta^m}{\lambda\theta^e} > \frac{\overleftrightarrow{\lambda\theta^m}}{\lambda\theta^e}$, *where* $\frac{\beta}{1-\beta} < \frac{\lambda\theta^m}{\underleftrightarrow{\lambda\theta^e}} < \frac{\overleftrightarrow{\lambda\theta^m}}{\lambda\theta^e}$ *are defined in* (1.44) *(Appendix). Welfare decreases in the whole economy when opening to trade whenever* $\frac{\lambda\theta^m}{\lambda\theta^e} \in \left(\underline{\frac{\lambda\theta^m}{\lambda\theta^e}}, \overline{\frac{\lambda\theta^m}{\lambda\theta^e}}\right)$, *where* $\underline{\frac{\lambda\theta^m}{\lambda\theta^e}}$ *and* $\overline{\frac{\lambda\theta^m}{\lambda\theta^e}}$ *are defined in* (1.46).

Proof. *See Appendix* ■

Let us interpret this proposition. The first statement says that the middle class producers only benefit with trade only when they are large enough relative to the size of the elite. And this is again capturing comparative advantage: when the middle class are large their prices are really low in the closed economy. Opening to trade increases the price of the good they produce and benefits them. But notice that the condition now is more restrictive than before, $\left(\widehat{\frac{\lambda\theta^m}{\lambda\theta^e}}\right) > \frac{\beta}{1-\beta}$. And this is reflecting the fact that trade increases expropriation. For the middle class producers to win with trade, their relative size has to be large enough to outweigh the increase in expropriation too.

For the elite the analysis is similar. Because they benefit from the increase in expropriation their relative size does not have to be as large for them to benefit with trade, $\frac{\lambda\theta^m}{\lambda\theta^e} < \frac{\lambda\theta^m}{\underleftrightarrow{\lambda\theta^e}}$, where $\frac{\beta}{1-\beta} < \frac{\lambda\theta^m}{\underleftrightarrow{\lambda\theta^e}}$. Notice that the elite producers also benefit with trade when they are small enough, that is when $\frac{\lambda\theta^m}{\lambda\theta^e} > \frac{\overleftrightarrow{\lambda\theta^m}}{\lambda\theta^e}$. The reason is that their income is composed of profits and taxation. When the middle class is a very large group, most of the elite's income comes from tax revenues. Also, when the middle class producers are very large, their price goes up when they open to trade. This benefits the elite too, and more than outweighs the decrease in the elite's profits.

Welfare increases with trade only if the elite producers are either very large or very small. And this is simple to interpret. When the two groups are very similar, the relative price of their goods is close to 1. This means that the gains from opening to trade are not that large. In this case the increase in inefficiency outweighs the gains from trade. We need the gains from trade to be large enough for trade to be welfare enhancing. And this is the case when the groups are very different in size.

1.4.2 Factor Price Manipulation

Whenever this is the case we have seen that only the elite producers make profits, both with and without trade. Also, because state capacity is null, $\phi = 0$, there is no direct benefit from taxation, $T^e = 0$. Total welfare before and after trade is then

$$\begin{aligned} W_{FPM} &= w_{FPM} + \pi^e_{FPM} \\ W_{FPM,T} &= \pi^e_{FPM,T}. \end{aligned}$$

Let us discuss first what would happen in this model without taxation. As we have already discussed, the economy as a whole would always win. What happens with the elite and the middle class in such a model? Because prices would be equal in both sectors, neither of the groups would make profits with trade: all the benefits would go to labor. Thus, the elite producers would lose with trade whenever they had profits in the closed economy, that is when $\beta > \lambda\theta^e$.

When we incorporate taxation two points are worth making. First, workers are strictly worse off. Wages drop from a positive value in the closed economy all the way down to 0 with trade. Second, the middle class will remain unaffected by trade opening: they make no profit in either case [21] Thus, whether the economy wins or loses with trade will depend on whether the elite producers win enough to outweigh the welfare loss of the workers. Proposition 9 summarizes the results:

Proposition 11 *When Factor Price manipulation is the source of inefficiency and the economy opens to trade, workers always lose. The middle class is unaffected, having no profits either before or after trade. For the elite producers, if* (1.50) *(Appendix) holds they win with trade whenever* $\lambda\theta^e > \underline{\lambda\theta^e_{FPM}}$, *where* $\underline{\lambda\theta^e_{FPM}} < \beta$ *is defined in* (1.49) *(Appendix). Whenever* (1.50) *does not hold, elite producers win with trade when* $\lambda\theta^e > \overline{\lambda\theta^e_{FPM}}$, *with* $\overline{\lambda\theta^e_{FPM}} > \beta$ *defined in* (1.51) *(Appendix). Welfare decreases in the whole economy when opening to trade whenever* $\lambda\theta^e < \lambda\theta^e_{FPM}$, *where* $\lambda\theta^e_{FPM} > \beta$ *is defined in* (1.48) *(Appendix).*

[21] In the closed economy the elite producers always tax the middle class to shift relative demand until they make profits. The only case when they do not tax the middle class is when $\sigma(\beta, \theta^e) > 1$. Lemma 1 shows that the middle class producers do not make profits either in this case.

Let us discuss the intuition behind these results. Why do the elite producers lose with trade when they are a small group? In this model, comparative advantage with the rest of the world is determined by the relative size of each group. When the elite producers are small, that means that in the closed economy the prices of the goods they produce are very high because they are the scarce "factor". On the other hand, trade allows the elite rulers to tax the middle class more heavily, dropping the wage rate to 0. Which effect dominates will depend on how small the elite producers are, the smaller the group the bigger the drop in prices, which might more than outweigh the decrease in the wage rate. Notice that, as in the previous section, the elite benefit from trade for a bigger range of parameters than without expropriation.

Also, because the only group that ever wins with trade is the elite producers (whenever they do), for trade to be welfare enhancing it must be the case that the economy is almost only composed of this elite. The country only wins with trade if the elite is a very large part of society.

By adding expropriation, we go from a situation where the economy always wins with trade and the elite either loses or stays the same, to another situation in which the economy loses with trade unless the elite producers are a very big group, and the elite producers win unless they are a very small group. This is the heart of the problem: political institutions allow the elite producers to choose the policies that benefit them the most, without considering their repercussions on other groups of society. And they manage to benefit from trade at the expense of these other groups.

Finally, it is important to point out that the bigger losers in this context are the workers. The middle class producers make no profit either before or after trade; they are equally expropriated. But taxation on the middle class actually leaves the workers worse off through its effect on wages: the elite producers manage to expropriate all labor income from them.

1.5 Political Equilibrium under Democracy

Let us now briefly discuss what happens when, instead of a dictatorship of the elite, we have a democracy. A democracy is a set of political institutions that gives the right to vote and thus take part in the policy-making process to the majority of the population. In what follows I

assume $\theta^e + \theta^m < 1$. With this assumption political institutions that give all the political power to the workers correspond to a democracy, as workers are the majority. It could be argued that this is an ad-hoc assumption about the composition of power in a democracy, that democracies do not necessarily represent the preferences of the workers; in most of the developed world, for example, the majority is the middle class. At a first approximation, however, when a country transitions from dictatorship to democracy, it tends to be the case that most of its society is composed of workers. When one examines the dictatorships in today's less-developed economies, in most cases one finds that workers are in the majority. Great levels of inequality, a small elite, and an almost non-existent middle class characterize most economies with dictatorships, especially in sub-Saharan Africa.

The main difference between democracy and dictatorship for these purposes is that the workers, participating as they do in all sectors of the economy, have preferences for inefficiency that are in line with the economy as a whole. In other words: because workers are hired in all sectors, and because they do not care about profits, they do not want to distort resource allocation across sectors. Because they do not distort resource allocation across sectors, it is not costly for them to set their desired tax rates in the closed economy on a basis other than the standard Laffer Curve. As a consequence, trade will not have an effect on the taxes they set.

The following sections will characterize the political equilibrium of this democracy with and without trade. Before doing that, let us note what happens when the source of inefficiency is exclusively Factor Price manipulation, $\phi = 0$. This is a very trivial case. Workers never make profits and they are not able to benefit directly from taxation. Because any taxation feeds directly into the wage rate and reduces it, both with and without trade, they will never set a positive level of taxation in any of the groups. Therefore, when Factor Price manipulation is the source of inefficiency, a democracy is non-distortionary, and opening to international trade is always welfare enhancing. Let us now analyze Revenue Extraction.

1.5.1 Closed Economy

Because we assume that Condition (1.4) holds, wages drop to 0 and the only source of income for workers are taxes. The problem for the workers becomes

$$\underset{\tau^e,\tau^m}{Max}\ \phi y(\beta\tau^e + (1-\beta)\tau^m),$$

with y given by (1.15). After the analysis for the dictatorship it is straightforward to see that the solution to this problem is

$$\tau_{RE}^{m,d} = \tau_{RE}^{e,d} = \alpha,$$

where d stands for democracy.[22] Workers tax both sectors symmetrically. This is intuitive, given that workers do not care about profits. Taxing both sectors in the same amount does not distort relative demands, thus minimizing the effect of the distortion in final output. Notice that the general equilibrium effect is not stopping the workers from setting the desired tax rates; this is precisely because workers themselves remove the general equilibrium effect by setting equal tax rates.

1.5.2 Small Open Economy and Democracy

When we open the democracy to trade, the problem for the workers is given by

$$\underset{\tau^e,\tau^m}{Max}\phi\frac{\tau^m}{1-\alpha}(1-\tau^m)^{\frac{1-\alpha}{\alpha}}\lambda\theta^m + \phi\frac{\tau^e}{1-\alpha}(1-\tau^e)^{\frac{1-\alpha}{\alpha}}\lambda\theta^e,$$

where recall that wages are still 0 in the open economy, so income for the workers is solely taxes. This is exactly the same problem as with the closed economy, replacing β and $(1-\beta)$ with $\lambda\theta^e$ and $\lambda\theta^m$, which implies that the solution does not change,

$$\tau_{RE,T}^{m,d} = \tau_{RE,T}^{e,d} = \alpha.$$

[22] See appendix for the proof that symmetric taxation is always the solution where Revenue Extraction is the sole source of inefficiency.

Taxation does not change with trade; this has the immediate implication that trade is welfare improving for this economy as it will only be affected by the standard benefits of trade.

Proposition 12 *Under a democracy, trade does not have any effect on the sources of inefficiency and taxation does not change. Opening to trade is always welfare enhancing.*

What is different between democracies and dictatorships that leads to such different results? Democracies typically give more weight to workers in the decision-making process and workers participate in all sectors of the economy. This makes them reluctant to tax and distort resource allocation across sectors, because any distortion feeds back into the wage rate; this reticence leads in general to lower distortions. In addition, workers do not care about profits. Because they do not care about profits, the general equilibrium effect that stops the elite producers from setting their desired tax rates does not apply to them and trade has no effect on workers' preferences for inefficiency.

Finally it is important to notice that although in the Factor Price Manipulation case a democracy is more efficient than a dictatorship in absolute terms, under Revenue Extraction this may not be the case. In particular it can be shown that a democracy will give higher welfare except for really low levels of state capacity, ϕ. The reason is that when this is the case, dictatorships do not tax at all or tax at really low levels because the general equilibrium effect hurts them too much.[23] This result is just a consequence of assuming excess labor supply. With labor market clearance workers would take into account the effect of taxation in wages and democracies would always tend to be more efficient than dictatorships.[24]

1.6 Conclusions

This paper began by describing how less-developed economies with dictatorial regimes have remained stagnant with respect to economic performance over the last four decades. At the same time, those countries are much more integrated to the global economy than they were 40 years ago. I claimed that these two facts are not independent of each other and interpreted

[23] And remember that workers tax both sectors always.
[24] See Acemoglu (2005) for a discussion of this.

them as evidence that traditional trade theories cannot explain these experiences because they lack an important ingredient: the efficiency of institutions.

I developed a simple model that endogenized the efficiency of institutions and argued that part of the reason why poor nations may not have benefited as much from international trade is because increased trade may lead to worse policies and economic institutions in societies with weak political institutions: in a closed economy, groups with political power are restrained in their rent extraction policies because of the general equilibrium price effects that these will create. Increased international trade removes these price effects and may increase the intensity of rent extraction, and with that increase inefficiency. The increase in inefficiency may more than outweigh the standard gains from trade, and trade integration can potentially make the whole economy worse off.[25]

Whether this is something relevant empirically is something to address in the future, although as mentioned in the introduction, Segura-Cayuela (2006) is a first effort to provide evidence that the main result in the current paper is present on the data. I use a panel of 92 countries and 17 years to show that expropriation increases with trade opening for non-democratic countries, while it is reduced for democratic ones.

This paper tries to caution about trade policy recommendations for less-developed economies with weak political institutions and insufficient checks on the executive power. Policy recommendations should be about long run economic performance, not about trade. Rodrik (1998), in the context of sub-Saharan Africa, argued that trade should not be the focus of economic policy: the quick fix that trade may provide cannot substitute for the poor quality of institutions. My paper goes even further by saying that trade may not even provide that quick fix and it can actually deteriorate the quality of institutions.

External trade policy recommendations will have damaging effects, according to my model. And this will be true even if these recommendations include measures to reduce the state's intrusion and liberalize markets. If incentives are not modified, governments in these countries can easily find alternative ways of reaching its intrusive and rent extracting objectives. As long as political institutions do not change, incentives to expropriate will be in place and trade can potentially deteriorate the quality of institutions. The important question that follows from

[25] Because in my model preferences were linear, all th discussion about welfare applies to income levels.

this discussion is whether trade can help transition to better political institutions.

Can trade change political institutions? This paper analyzes how trade affects preference for inefficiency, but all the analysis assumes that, with the introduction of trade, political power either does not change or changes in a direction that does not affect the results. Nonetheless, the relationship between political power, economic performance, economic institutions, and political institutions is a non-trivial, dynamic one. There are two types of political power: de jure and de facto. De jure political power is the power of the ruler as derived from political institutions. De facto political power is the ability of other groups in society to restrict de jure political power and exert their own through, for instance, violence or protests. It is important to note that de facto power derives directly from the distribution of resources. Thus, policies that affect the distribution of resources will indirectly affect tomorrow's allocation of power and with that the persistence and efficiency of political institutions.[26] Because trade might change the distribution of resources today, it might affect the allocation of power tomorrow, and with that it might affect the type of political institutions a country develops. In other words, trade itself might affect whether a country is in the top or bottom of Figure 2.

An example of this is found in chapter 10 of Acemoglu and Robinson (2005). In their framework, democracies are costly for political elites because they imply redistribution towards other social groups. To the extent that trade reduces inequality it also reduces redistribution, which can make the political elite less reluctant to allow democratization. Also, in an extension to my paper I am currently working on, I am analyzing how trade affects political institutions. For instance, the fact that trade exacerbates expropriation does not necessarily mean that trade makes a regime change less likely to occur. While trade can have negative effects, it might still benefit some groups -other than the elite- through standard trade effects and it might increase the incentives to overthrow inefficient regimes. First non-elite groups are now more oppressed and this makes their situation less desirable; and second, the benefits of being in power increase for non-elite groups for the same reason than it increases for the elite minority. When does opening to trade evolve into a democracy? When do we get a dictatorship of the middle class? All these questions are interesting areas for future research, and questions that I am currently

[26] See Acemoglu and Robinson (2005) for a discussion on the distinction between de jure and de facto political power.

addressing on a companion paper.

Finally this paper has abstracted from factor mobility and the role of factor endowments. It would be interesting to combine the forces at play in this model with the standard force in the literature: capital mobility reduces expropriation in less-developed economy to avoid capital leaving the economy. To address this question it is important to understand several issues. First, who is the elite of a dictatorship and why? It is clear that dictatorships from now and the past have differed on the type of elite they had. And even inside the same dictatorship the elite modified over time. Second, what is the role of factor endowments in all this? Do factor endowments have any role determining the type of elite? All these forces are important if we want to understand how the mechanism in this model interacts with capital mobility. My work in Segura Cayuela (2006b) is a first attempt to understand these issues.

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1.7 Appendix A: Proofs

1.7.1 Proof of Proposition 3

We need to show that the elite producers never want to tax themselves. To do this, we split the analysis in two. First, we need to show that there is no solution where the elite tax both sectors. Then, we need to show that any solution where the elite only tax themselves gives them less income than taxing only the middle class. The problem for the elite is

$$\underset{\tau^m,\tau^e}{Max} \left((1-\tau^e)^{\beta}(1-\tau^m)^{(1-\beta)}\right)^{(1-\alpha)/\alpha} * \\ \left(\phi\left(\beta\tau^e + (1-\beta)\tau^m\right) + \alpha\beta(1-\tau^e)\right).$$

The *F.O.C.s* are

$$(\tau^e) \quad \left((1-\tau^e)^{\beta}(1-\tau^m)^{(1-\beta)}\right)^{(1-\alpha)/\alpha} * \\ \left[-\frac{\beta^{\frac{(1-\alpha)}{\alpha}}}{(1-\tau^e)}\left(\phi\left(\beta\tau^e + (1-\beta)\tau^m\right) + \alpha\beta(1-\tau^e)\right) + \beta(\phi-\alpha)\right] = 0$$

$$(\tau^m) \quad \left((1-\tau^e)^{\beta}(1-\tau^m)^{(1-\beta)}\right)^{(1-\alpha)/\alpha} * \\ \left[-\frac{(1-\beta)^{\frac{(1-\alpha)}{\alpha}}}{(1-\tau^m)}\left(\phi\left(\beta\tau^e + (1-\beta)\tau^m\right) + \alpha\beta(1-\tau^e)\right) + (1-\beta)\phi\right] = 0$$

Notice that if $\phi < \alpha$ the *FOC* for τ^e is always negative , so the elite would set $\tau^e = 0$. Assume this is not the case. A solution with both tax rates positive requires, combining both equations, that

$$(1-\tau^m) = \frac{\phi-\alpha}{\phi}(1-\tau^e) = \eta(1-\tau^e).$$

We can now replace this in the *FOC* for τ^e and after some algebra we get to

$$-(1-\alpha)\phi + (1-\tau^e)(\phi-\alpha),$$

And notice that even for $\tau^e = 0$ this is negative. So there is no equilibrium where the elite tax both sectors at the same time. If they tax just one sector the equilibrium rates in each case are just found by solving each of the *FOC* assuming the other tax rate is 0. This gives

$$\tau^{m*} = Max\left[0, \frac{\alpha\left(\phi - \beta(1-a)\right)}{\phi(1-\beta(1-\alpha))}\right]$$

and

$$1 - \tau^{e*} = Min\left[1, \frac{\phi}{\phi - \alpha}\frac{\beta(1-\alpha)}{\alpha + \beta(1-\alpha)}\right]$$

From this we derive that $\tau^e > 0$ if $\phi > (\alpha + \beta(1-\alpha))$, and $\tau^m > 0$ if $\phi > \beta(1-a)$. So for $\phi \in [\beta(1-a), (\alpha + \beta(1-\alpha))]$ we know that the solution is given by $\tau^m = Max\left[0, \frac{\alpha(\phi - \beta(1-a))}{\phi(1-\beta(1-\alpha))}\right]$. For $\phi \in [(\alpha + \beta(1-\alpha)), 1]$ we need to check which taxation gives the elite producers more income. It is straightforward to check that

$$\begin{aligned}
\left.\frac{\partial \pi^e}{\partial \tau^e}\right|_{\tau^e=0,\tau^m=\tau^{m*}} &\leq 0, \quad \left.\frac{\partial \pi^e}{\partial \tau^m}\right|_{\tau^e=0,\tau^m=\tau^{m*}} = 0 \\
\left.\frac{\partial \pi^e}{\partial \tau^e}\right|_{\tau^e=\tau^{e*},\tau^m=0} &= 0, \quad \left.\frac{\partial \pi^e}{\partial \tau^m}\right|_{\tau^e=\tau^{e*},\tau^m=0} > 0,
\end{aligned}$$

for $\phi \in [(\alpha + \beta(1-\alpha)), 1]$, which immediately implies that $\tau^e = \tau^{e*}$ and $\tau^m = 0$ is not a solution. This concludes the proof.

1.7.2 Proof that Symmetric Taxation is the Solution with a Democracy in a Closed Economy

The problem for the workers is

$$\underset{\tau^e,\tau^m}{Max}\ \phi\frac{\chi\left(\lambda\theta^e\right)^{\beta}\left(\lambda\theta^m\right)^{1-\beta}}{1-\alpha}\left((1-\tau^e)^{\beta}(1-\tau^m)^{(1-\beta)}\right)^{(1-\alpha)/\alpha}(\beta\tau^e + (1-\beta)\tau^m).$$

The *F.O.C.s* are

$$(\tau^e)\quad \left((1-\tau^e)^{\beta}(1-\tau^m)^{(1-\beta)}\right)^{(1-\alpha)/\alpha} * \left[-\frac{\beta\frac{(1-\alpha)}{\alpha}}{(1-\tau^e)}(\beta\tau^e + (1-\beta)\tau^m) + \beta\right] = 0$$

$$(\tau^m) \quad \left((1-\tau^e)^\beta(1-\tau^m)^{(1-\beta)}\right)^{(1-\alpha)/\alpha} * \left[-\frac{(1-\beta)\frac{(1-\alpha)}{\alpha}}{(1-\tau^m)}\left(\beta\tau^e+(1-\beta)\tau^m\right)+1-\beta\right]=0.$$

The solution with both tax rates positive is given by,

$$\tau^e = \tau^m = \alpha.$$

If they only tax one sector it is easy to check that

$$\begin{aligned} \left.\frac{\partial\pi^e}{\partial\tau^e}\right|_{\tau^e=0,\tau^m=\tau^{m*}} &> 0, \quad \left.\frac{\partial\pi^e}{\partial\tau^m}\right|_{\tau^e=0,\tau^m=\tau^{m*}} = 0 \\ \left.\frac{\partial\pi^e}{\partial\tau^e}\right|_{\tau^e=\tau^{e*},\tau^m=0} &= 0, \quad \left.\frac{\partial\pi^e}{\partial\tau^m}\right|_{\tau^e=\tau^{e*},\tau^m=0} > 0, \end{aligned}$$

i.e. taxing just one sector is not a solution. This completes the proof.

1.7.3 Proofs for Welfare Analysis with Revenue Extraction

Individual Groups

Let us look at what happens with the middle class once we incorporate taxation. The middle class is better off with trade if $\pi^m_{RE,T} > \pi^m_{RE}$, which looking at equations (1.17) and (1.37) translates into

$$\frac{(1-\tau^m_{RE})^{(1-\beta(1-\alpha))/\alpha}}{\left(1-\tau^m_{RE,T}\right)^{1/\alpha}}\left(\frac{1-\beta}{\beta}\frac{\lambda\theta^e}{\lambda\theta^m}\right)^\beta < 1,$$

or

$$\left(\frac{\lambda\theta^m}{\lambda\theta^e}\right)^\beta > \left(\frac{1-\beta}{\beta}\right)^\beta \frac{(1-\tau^m_{RE})^{(1-\beta(1-\alpha))/\alpha}}{(1-\alpha)^{1/\alpha}} = \left(\widehat{\frac{\lambda\theta^m}{\lambda\theta^e}}\right), \tag{1.43}$$

where notice that $\left(\widehat{\frac{\lambda\theta^m}{\lambda\theta^e}}\right) > \left(\frac{1-\beta}{\beta}\right)^\beta$ because $\tau^m_{RE} < \alpha$ and $1-\beta(1-\alpha) < 1$.

For the elite the analysis is much more cumbersome. I want to prove that they benefit for $\left(\frac{\lambda\theta^m}{\lambda\theta^e}\right)^\beta < \left(\frac{1-\beta}{\beta}\right)^\beta \omega$, for some $\omega > 1$ and that they also benefit even when $\left(\frac{\lambda\theta^m}{\lambda\theta^e}\right)$ is very large. In other words I want to proof that there is an intermediate range of $\frac{\lambda\theta^m}{\lambda\theta^e}$ in which the elite is worse off. Income for the elite is higher with trade if

$$\alpha\lambda\theta^e + \alpha\lambda\theta^m (1-\alpha)^{(1-\alpha)/\alpha} \phi >$$
$$\chi (1-\tau_{RE}^m)^{(1-\beta(1-\alpha))/\alpha} (\lambda\theta^e)^\beta (\lambda\theta^m)^{1-\beta} [\alpha\beta + \phi(1-\beta)\tau_{RE}^m],$$

and rearranging terms this translates into

$$\left(\frac{\lambda\theta^m}{\lambda\theta^e}\right)^{1-\beta} \leq \left(\frac{1-\beta}{\beta}\right)^{1-\beta} \beta \frac{1 + \frac{\lambda\theta^m}{\lambda\theta^e}\phi (1-\alpha)^{(1-\alpha)/a}}{\left(1-\tau_{RE}^m\right)^{(1-\beta)(1-\alpha)/a} \left(\beta + \frac{\tau_{RE}^m}{\alpha}\phi(1-\beta)\right)}. \tag{1.44}$$

where τ_{RE}^m is defined as in Proposition 3. Allow me to define

$$\eta \equiv \frac{\phi (1-\alpha)^{(1-\alpha)/a}}{\left(1-\tau_{RE}^m\right)^{(1-\beta)(1-\alpha)/a} \left(\beta + \frac{\tau_{RE}^m}{\alpha}\phi(1-\beta)\right)}.$$

Notice two things. First, the right hand side (RHS) of equation (1.44) is linear (and increasing) in $\frac{\lambda\theta^m}{\lambda\theta^e}$ while the LHS is concave and increasing in $\frac{\lambda\theta^m}{\lambda\theta^e}$. Second, when $\frac{\lambda\theta^m}{\lambda\theta^e} \to 0$ the condition is satisfied. And because the derivative of the LHS goes to 0 when $\frac{\lambda\theta^m}{\lambda\theta^e} \to \infty$ we know that if the LHS and the RHS cross once, they will cross a second time. If they do not cross trade makes the elite better off for any relative size of the middle class and the elite. If they cross, the elite producers are better off with trade both when they are relatively small or they are relatively large with respect to the middle class. To proof that there is a crossing is enough to show that when the derivative of both sides are equal, the value of the LHS is bigger than that of the RHS. This is how I proceed now. The derivatives with respect to $\frac{\lambda\theta^m}{\lambda\theta^e}$ are equal when

$$(1-\beta)\left(\frac{\lambda\theta^m}{\lambda\theta^e}\right)^{-\beta} = \left(\frac{1-\beta}{\beta}\right)^{1-\beta} \beta\eta,$$

or rearranging

$$\frac{\lambda\theta^m}{\lambda\theta^e} = \frac{1-\beta}{\beta}\eta^{-1/\beta}. \tag{1.45}$$

I now replace this on the RHS and LHS and check whether LHS>RHS, or

$$\eta^{-(1-\beta)/\beta} > \frac{1}{\left(1-\tau_{RE}^{m}\right)^{(1-\beta)(1-\alpha)/a}\left(1+\frac{\tau_{RE}^{m}}{\alpha}\phi^{\frac{1-\beta}{\beta}}\right)}$$
$$\Leftrightarrow \left(\frac{1-\tau_{RE}^{m}}{(1-\alpha)}\right)^{(1-\beta)(1-\alpha)/a} > \frac{\phi^{1-\beta}}{\left(\left(1+\frac{\tau_{RE}^{m}}{\alpha}\phi^{\frac{1-\beta}{\beta}}\right)\right)}.$$

And notice that $\left(\frac{1-\tau_{RE}^{m}}{(1-\alpha)}\right)^{(1-\beta)(1-\alpha)/a} \geq 1$ and. $\frac{\phi^{1-\beta}}{\left(\left(1+\frac{\tau_{RE}^{m}}{\alpha}\phi^{\frac{1-\beta}{\beta}}\right)\right)} < 1$. This proofs that there is an intermediate range of $\frac{\lambda\theta^{m}}{\lambda\theta^{e}}$ for which income of he elite decreases with trade.

We only need to proof now that the first range for which the elite benefits with trade is bigger than in a model without expropriation, that is, the first time the two curves cross is for $\frac{\lambda\theta^{m}}{\lambda\theta^{e}} < \frac{1-\beta}{\beta}\omega$ for some $\omega > 1$. We know that $\eta < 1$ To see this notice that $(1-\tau_{RE}^{m})^{(1-\beta)(1-\alpha)/a} > (1-\alpha)^{(1-\alpha)/a}$ and

$$(\beta + \frac{\tau_{RE}^{m}}{\alpha}\phi(1-\beta)) = \frac{(1-\beta)\phi+\alpha\beta}{(1-\beta)+\beta\alpha} > \phi.$$

Given that $\eta < 1$ and looking at (1.45) we know that the point where our two income curves have the same slop is one in which $\frac{\lambda\theta^{m}}{\lambda\theta^{e}} > \frac{1-\beta}{\beta}$. And this means that the second crossing of the two curves is for $\frac{\lambda\theta^{m}}{\lambda\theta^{e}} >> \frac{1-\beta}{\beta}$. That means that if we find that for $\frac{\lambda\theta^{m}}{\lambda\theta^{e}} = \frac{1-\beta}{\beta}$ trade gives higher income to the elite we are done: the first crossing will be for $\frac{\lambda\theta^{m}}{\lambda\theta^{e}} \in \left(\frac{1-\beta}{\beta}, \frac{1-\beta}{\beta}\eta^{-1/\beta}\right)$. And this is easy to show. Replacing $\frac{\lambda\theta^{m}}{\lambda\theta^{e}}$ in (1.44) the condition translates into

$$1 \leq \frac{1+\frac{(1-\beta)}{\beta}\phi\,(1-\alpha)^{(1-\alpha)/a}}{\left(1-\tau_{RE}^{m}\right)^{(1-\beta)(1-\alpha)/a}\left(1+\frac{\tau_{RE}^{m}}{\alpha}\phi^{\frac{(1-\beta)}{\beta}}\right)}.$$

Replacing by τ_{RE}^{m} it is straightforward to check that this is always the case. This completes the proof. There is a range $\left(\underset{\longleftrightarrow}{\frac{\lambda\theta^{m}}{\lambda\theta^{e}}}, \frac{\overleftrightarrow{\lambda\theta^{m}}}{\lambda\theta^{e}}\right)$ such that inside the range the elite are worse off with trade and better off outside that range. Also, $\underset{\longleftrightarrow}{\frac{\lambda\theta^{m}}{\lambda\theta^{e}}} > \frac{(1-\beta)}{\beta}$, that is expropriation allows the elite to benefit from trade for a bigger range of relative sizes. The cut-off values are the solution to (1.44)

Total Welfare

The steps of the proof will be very similar to the discussion for the elite. We want to proof that there is an intermediate range of $\frac{\lambda\theta^m}{\lambda\theta^e}$ in which the economy is better off without trade. Comparing the expressions for total income before and after trade opening to trade reduces welfare if

$$\frac{\left(1+\frac{\tau_{RE}^m}{\alpha}(\phi-\alpha)(1-\beta)\right)\left(1-\tau_{RE}^m\right)^{(1-\beta)(1-\alpha)/a}}{\beta^\beta(1-\beta)^{1-\beta)}}\left(\frac{\lambda\theta^m}{\lambda\theta^e}\right)^{1-\beta}\geq\left(1+\frac{\lambda\theta^m}{\lambda\theta^e}(1+\phi-\alpha)\left(1-\alpha\right)^{(1-\alpha)/a}\right). \tag{1.46}$$

Notice again that the LHS is concave and increasing in $\frac{\lambda\theta^m}{\lambda\theta^e}$, while the RHS is increasing and linear in $\frac{\lambda\theta^m}{\lambda\theta^e}$. Also when $\frac{\lambda\theta^m}{\lambda\theta^e}\to 0$, RHS<LHS, which means that when the middle class is small trade increases welfare. Again we need to find whether the LHS and the RHS cross. If they do not, trade is always welfare enhancing. If they do, they will cross twice, and trade will only be welfare enhancing for either small or large $\frac{\lambda\theta^m}{\lambda\theta^e}$. Proceeding as before, for the two curves to have the same slope it has to be the case that

$$(1-\beta)\left(\frac{\lambda\theta^m}{\lambda\theta^e}\right)^{-\beta}\upsilon=\beta^\beta(1-\beta)^{1-\beta}\kappa,$$

or

$$\frac{\lambda\theta^m}{\lambda\theta^e}=\frac{1-\beta}{\beta}\left(\frac{\upsilon}{\kappa}\right)^{1/\beta}, \tag{1.47}$$

where I define

$$\begin{aligned}\upsilon &\equiv \left(1+\frac{\tau_{RE}^m}{\alpha}(\phi-\alpha)(1-\beta)\right)\left(1-\tau_{RE}^m\right)^{(1-\beta)(1-\alpha)/a}\\ \kappa &\equiv \left(1+\phi-\alpha\right)\left(1-\alpha\right)^{(1-\alpha)/a}.\end{aligned}$$

Replacing (1.47) in the equation comparing profits, we have that no trade gives a higher welfare when both curves have the same slope if

$$\frac{\upsilon^{1/\beta}\kappa^{-(1-\beta)/\beta}}{\beta}\geq 1+\frac{1-\beta}{\beta}\upsilon^{1/\beta}\kappa^{-(1-\beta)/\beta},$$

or $\upsilon \geq \kappa^{1-\beta}$, which can be rewritten as

$$\frac{(1-\tau_{RE}^{m})^{(1-\beta)(1-\alpha)/a}\,(1+\frac{\tau_{RE}^{m}}{\alpha}(\phi-\alpha)(1-\beta))}{(1+\phi-\alpha)^{1-\beta}} \geq ((1-\alpha))^{(1-\beta)(1-\alpha)/a}.$$

After some algebra it is easy to see that the LHS is a decreasing function of ϕ. And notice that for $\phi = 1$ (and $\tau_{RE}^{m} = \alpha$) this condition is satisfied,

$$1 + (1-\alpha)(1-\beta) > (1-\alpha)^{1-\beta}.$$

Thus for all $\phi < 1$ the condition is satisfied too. This concludes the proof. There is a range $\left(\frac{\lambda\theta^{m}}{\lambda\theta^{e}}, \overline{\frac{\lambda\theta^{m}}{\lambda\theta^{e}}}\right)$ such that for $\frac{\lambda\theta^{m}}{\lambda\theta^{e}}$ inside that range trade reduces welfare. The cut-off values are the solution to (1.46).

1.7.4 Proofs for Welfare Analysis with Factor Price Manipulation

Total welfare before and after trade is then

$$W_{FPM} = w_{FPM} + \pi_{FPM}^{e} = \frac{\theta^{e}\lambda}{\sigma(\beta,\theta^{e})^{\beta}}\frac{\alpha}{1-\alpha}\left[\sigma(\beta,\theta^{e}) - (1-\tau_{FPM}^{m})\right](1-\tau_{FPM}^{m})^{(1-\beta)(1-\alpha)/\alpha} + \frac{\alpha}{1-\alpha}(1-\tau_{FPM}^{m})^{(1-\beta)1/\alpha}\left(\frac{\sigma(\beta,\theta^{e})}{(1-\tau_{FPM}^{m})}\right)^{-\beta}$$

$$W_{FPM,T} = \pi_{FPM,T}^{e} = \frac{\alpha}{1-\alpha}\lambda\theta^{e}.$$

Remember that whenever $\sigma(\beta,\theta^{e}) > ((1-\beta)(1-\alpha)+\alpha)/(1-\beta)(1-\alpha)$ there is no taxation in the closed economy. In this case, welfare in the closed economy is higher than with trade if the following is true,

$$\sigma(\beta,\theta^{e})^{1-\beta} > \beta,$$

where to derive this expression I just manipulate W_{FPM} and $W_{FPM,T}$ and cancel terms. Notice that we are analyzing the case where $\sigma(\beta,\theta^{e}) > ((1-\beta)(1-\alpha)+\alpha)/(1-\beta)(1-\alpha) > 1$. Thus when the elite producers do not set any tax on the middle class in the closed economy and the economy opens to trade, the whole economy loses.

Whenever there is positive taxation in the closed economy, where the tax rate is given

in Proposition 4, welfare in the closed economy is higher if, after replacing the tax rate and manipulating the equations,

$$\frac{(\sigma(\beta,\theta^e)\delta)^{(1-\beta)/a}}{\delta^{1-\beta}}(1+\delta(1-\lambda\theta^e)>\lambda\theta^e$$

where I define $\delta=(1-\beta)(1-\alpha)/((1-\beta)(1-\alpha)+\alpha)$. Notice first that whenever $\sigma(\beta,\theta^e)=\delta^{-1}$, which is the point where taxation starts to be positive in the closed economy, the above condition is satisfied. Also, if we increase $\lambda\theta^e$, the right hand side of the condition goes up, while the left hand side goes down. In the limit, when $\lambda\theta^e=1$, the condition is not satisfied. This means that there is a level $\lambda\theta^e_{FPM}>\beta$ such that the economy as a whole wins when opening to trade if $\lambda\theta^e_{FPM}<\lambda\theta^e$, where $\lambda\theta^e_{FPM}$ is implicitly defined in

$$\frac{(\sigma(\beta,\lambda\theta^e_{FPM})\delta)^{(1-\beta)/a}}{\delta^{1-\beta}}(1+\delta(1-\lambda\theta^e_{FPM})=\lambda\theta^e_{FPM}. \tag{1.48}$$

Now let us look at what happens to the elite. The elite wins with trade if $\pi^e_{FPM}<\pi^e_{FPM,T}$. For $\sigma(\beta,\theta^e)\geq\delta^{-1}$ this translates into the following condition, (where recall that in this case $\tau^m_{FPM}=0$),

$$1>\frac{\sigma(\beta,\theta^e)-1}{\sigma(\beta,\theta^e)^\beta}.$$

Notice that it is not necessarily the case that when $\sigma(\beta,\theta^e)=\delta^{-1}$, the condition is satisfied. And because $(\sigma(\beta,\theta^e)-1)/\sigma(\beta,\theta^e)^\beta$ is decreasing in $\lambda\theta^e$, if the condition is not satisfied when $\sigma(\beta,\theta^e)=\delta^{-1}$ it will not satisfy for any higher $\sigma(\beta,\theta^e)$ (lower $\lambda\theta^e$, recall that $\sigma(\beta,\theta^e)$ is decreasing in $\lambda\theta^e$). If it is satisfied for $\sigma(\beta,\theta^e)=\delta^{-1}$, because the right hand side of the condition is decreasing in $\lambda\theta^e$, there will be a $\underline{\lambda\theta^e_{FPM}}<\beta$ such that for $\lambda\theta^e<\underline{\lambda\theta^e_{FPM}}$, the elite producers do not win with trade. $\lambda\theta^e_{FPM}$ is implicitly defined as

$$1=\frac{\lambda\theta^e_{FPM}-1}{\underline{\lambda\theta^e_{FPM}}} \tag{1.49}$$

For convenience let us write the condition evaluated in δ^{-1}.

$$\frac{1-\delta}{\delta}\delta^\beta<1. \tag{1.50}$$

Let us see now what happens for $\sigma(\beta,\theta^e) < \delta^{-1}$ (positive taxation in the closed economy). In this case, replacing the tax rate by its expression, the elite producers win with trade if

$$\frac{1-\delta}{\delta}\delta^{\beta}\left(\sigma(\beta,\theta^e)\delta\right)^{(1-\beta)/\alpha} < 1.$$

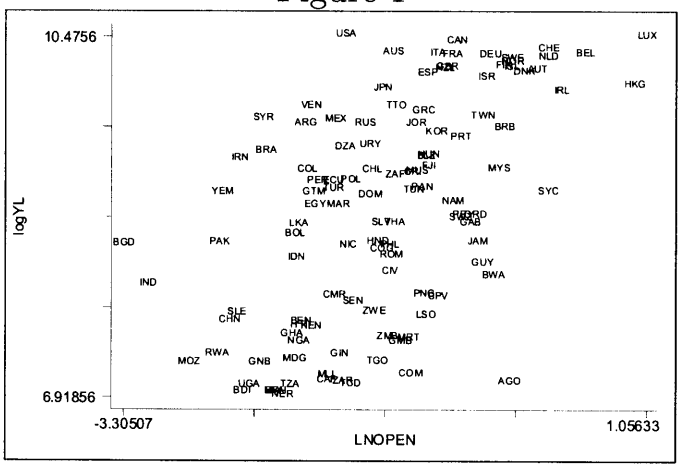
Notice that this condition always holds if $\delta^{\beta}(1-\delta\ )/\delta < 1$ because $\delta\sigma(\beta,\theta^e) < 1$. If this is not the case, then we need $\sigma(\beta,\theta^e)$ small enough so as to compensate ($\lambda\theta^e_{FPM}$ big enough), which translates into a cut off value $\overline{\lambda\theta^e_{FPM}} > \beta$ such that the elite wins with trade whenever $\lambda\theta^e > \overline{\lambda\theta^e_{FPM}}$. The parameter is defined implicitly in

$$\frac{1-\delta}{\delta}\delta^{\beta}\left(\sigma(\beta,\overline{\lambda\theta^e_{FPM}})\delta\right)^{(1-\beta)/\alpha} = 1 \tag{1.51}$$

This completes the proof.

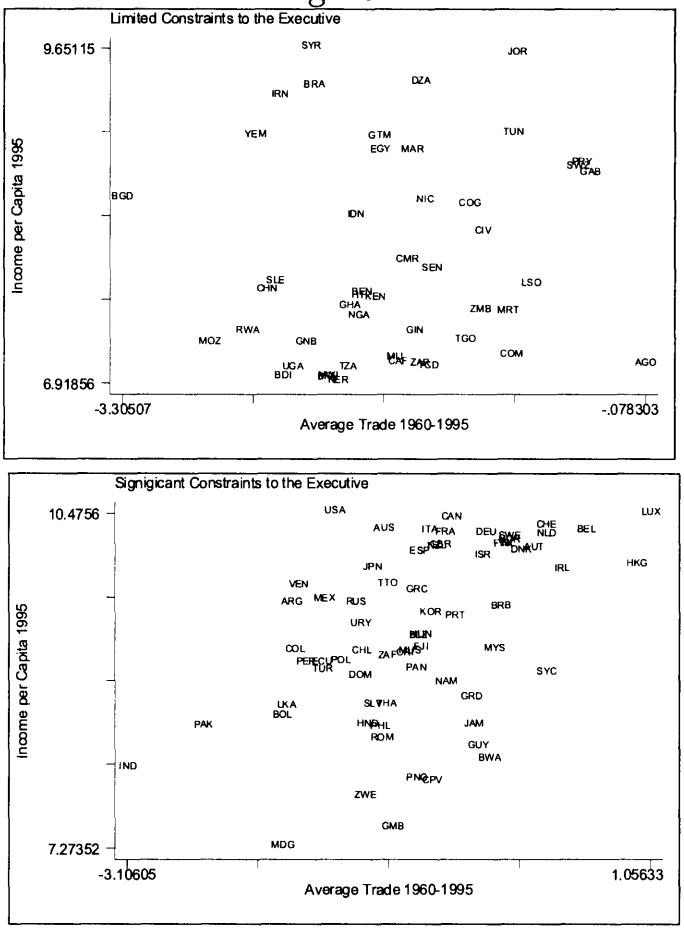
1.8 Appendix B: Figures

Figure 1



Source: Penn World Table Version 6.1

Figure 2



Sources: Penn World Table Version 6.1 and Polity IV data set

Chapter 2

Factor Endowments, Elites' Endowments, and the Open Economy

Summary 13 *This paper analyzes how the inefficiency of weak political regimes is shaped by the factor endowments of the elites, and how those inefficiencies alter standard predictions about international trade and international capital mobility. Elites in power always distort less sectors that make intensive use of the factors for which they are relatively better endowed, irrespective of the factor endowments of the economy. This implies that, when opening to trade, predictions about the factor content of trade can be reversed if the factor endowments of the elites differ from that of the economy. A capitalist elite will distort less sectors that make intensive use of capital, which may more than compensate for the scarcity of that factor, and make the country a net exporter of capital intensive goods. Also, when opening to international capital markets, the direction of capital flows can be reverted. A capital abundant country with a capitalist elite will distort less sectors that make intensive use of capital, which may more than compensate for the abundance of capital, and drive the return above that on the rest world, leading to capital inflows.*

2.1 Introduction

Why did East Asian dictatorships democratize and experience such a boost on economic performance? Why did most South American dictatorships fail to replicate the East Asian experience? We can find many examples like the ones just described, dictatorships that ended up in democracies and performing well economically, and others that did not democratize and or remained almost stagnant. There were (and still are) many differences not only between those regions but also between countries in each region that could explain the different paths followed. But something that was remarkably different between dictatorships in South America and those in East Asia was the identity of the elites. In South America the power was mostly on the hands of land owners, while in East Asia the elites were capitalists. Also, both regions were opened to international markets during large portions of the dictatorial regimes. Can the interaction of trade opening and factor endowments of the elites help explain those different paths?

This paper is a first step towards understanding the role that elites' factor endowments can play on determining whether a country democratizes and or experiences a boost on economic performance. It is going to be a small step, as it does not endogenize political institutions. What this paper does is to analyze how the inefficiency of weak political regimes is shaped by the factor endowments of the elites, and how those inefficiencies alter standard predictions about international trade or international capital mobility.

The main result for the closed economy will be that the elites tend to distort the economy as to favor those factors which they own on abundance, irrespective of the factor endowments of the economy. When opening to trade this implies that, when the elites' factor endowments differ from those of the economy, predictions about the factor content of trade can be reversed. It also implies that when opening to international capital markets, if the elites relative factor endowment is similar to that of the economy, predictions about the direction of capital flows can be reversed.

To explore this issue I use a framework similar to that in Segura-Cayuela (2006), endogenizing the efficiency of weak political institutions.[1] The set of political institutions will give all

[1] Segura-Cayuela (2006) builds on Acemoglu (2005).

political power to an elite minority, and this allows the elites to benefit from its policies regardless of how they affect the rest of society. The key policies in this model are sector specific tax rates, which are distortionary and there are no other means to extract resources from non-elite groups. The definition of taxation in this discussion is broad: it is any policy that leads to investment distortions in the economy (such as expropriation or corruption).

I depart from my previous work in two ways. First, I incorporate factor endowments on the analysis, the elites own shares of the factor endowments of the economy, and factors are used with different intensity across sectors. The purpose of this is to understand how the conflict of economic interests, that arises because of the different relative factor endowments than the elites and the rest of the economy have, can shape inefficiencies in this economy. Second, it is important to point out the difference approach between the current paper and Segura-Cayuela (2006). In my previous work, I characterize inefficiency before and after trade opening, or in other words, I analyze the effect that trade has on the efficiency of weak political institutions. In the present work the approach is the opposite, I characterize the effect that inefficient policies have on trade and capital flows predictions, incorporating factor endowments in the discussion.

The elites can extract resources from other groups in two ways. First, the elite might set distortionary taxes to extract revenue from other groups, the direct Revenue Extraction motive for expropriating other groups. Second, because they own fractions of the factor endowments of the economy, the elites can also benefit through an indirect channel: by taxing sectors differently, they can shape relative demand an with that increase the return of the factor that is used intensively in the better treated sector. This is similar to the Factor Price Manipulation motive for expropriation in Segura-Cayuela (2006), although in there it worked by depressing the demand for factors of other groups, which led to lower factor prices and higher profits for the elites on their production activities.[2]

The first result in this paper will be that the elites always expropriate less sectors that make intensive use of the factor which they own on a larger proportion, irrespective of the factor endowments of the economy. And the intuition for this result is straightforward: extracting revenue from producers is costly for the elites, as the general equilibrium effects of this reduces factor rewards. Because of that, the elites will always try to distort less sectors that use more

[2]The original term was introduced by Acemoglu (2005).

intensively the factor they own on a larger proportion, as this is their main source of income.

I then proceed to analyze the implications of this for the factor content of trade and the direction of capital flows. With respect to trade, what would determine the factor content of trade in the absence of inefficiencies would be relative factor endowments, a country is a net exporter of the sectors that make intensive use of the abundant factor in the economy. But if the relative endowment of the elites differs substantially from that of the economy, this prediction could be reversed. And the intuition is simple. If a country is relatively abundant on land compared with the rest of the world, it should be a net exporter of goods that are produced using intensively that factor. Once we take into account the political economy, the relative endowment of the elite is also going to matter. In particular, if the elites have a large relative endowment of capital they are going to treat sectors that use capital better, which is going to shift comparative advantage towards goods that are produced making intensive use of capital. This effect can make goods that use land intensively more expensive than in the rest of the world, despite land abundance.

The main implication of this result is that, in order to make predictions about the net factor content of trade of countries with weak political institutions, we need to take into account not only the endowments of the economy but also those of the elites. By looking only at the factor endowments of an economy we could predict the wrong factor content of trade and, in particular, the result suggests that we could possibly explain part of the Leontieff Paradox by incorporating political economy, if factor endowments of the elites tend to differ from those of the economy.[3] In other words, we could explain part of the differences in productivities between the North and the South that help with the Paradox, as shown in Trefler (1995), with this political economy mechanism.

With respect to capital flows I obtain a similar result. Without expropriation, capital should flow from capital abundant countries to capital scarce ones, until rewards are equalized. Once we incorporate the elites incentives, this direction could be reverted if the relative factor endowments of the elites are aligned with that of the economy. And the intuition is again simple: If a country is abundant in land (scarce in capital) we would predict large capital flows to that country in the absence of expropriation, as the return to capital should be large on

[3]See Trefler (1993) for a recent version of the Leontieff Paradox

that country. But if the elites are also relatively endowed with more land than capital, they are going to expropriate more from sectors that use capital intensively, driving the return of capital down. This effect may more than compensate for the scarcity of capital.

The main contribution of this paper is to emphasize the impact that the relative factor endowment of the elites may have altering standard predictions on the factor content of trade and on the direction of capital flows. To the best of my knowledge, this is the first paper to emphasize the role of the elites' relative factor endowments as a source of factor endowment driven comparative advantage or as affecting relative factor prices and driving capital flows. The emphasis on the interaction between the factor endowment of the elites and economic performance is not new. Barrington Moore in his book published in 1966 already emphasized the role of the elites and the middle class, and most importantly, their economic interests driven by their factor endowments, as the main force leading a dictatorial regime to democratize and/or success economically. And this is precisely the emphasis on the new book by Acemoglu and Robinson (2005). This paper is also related to the recent literature on the relation between trade and institutions, Bourguignon and Verdier (2000), Bourguignon and Verdier (2005), Do and Levchenko (2005), Levchenko (2004), Verdier (2005), among others.[4]

The rest of the paper is organized as follows. Section 2 presents the basic economic model and characterizes the economic and political equilibrium in a closed economy under a dictatorship of the elite. Section 3 characterizes the equilibrium with an open economy and given expropriation rates from the closed economy, and discusses the implications for trade flows and the factor content of trade. Section 4 analyzes the implications of the political equilibrium for capital flows, when opening to international capital markets. Section 5 concludes and discusses future lines of research.

2.2 The General Model with a Closed Economy

This section develops the basic economic model in a closed economy, where inefficiencies will arise due to limited checks on the executive power and the desire of the elites to extract rents from other groups in society. I will first solve for the economic equilibrium for a given

[4]For the effects of institutions in trade/FDI, see for instance Levchenko(2004), Antràs (2003, 2005), or Antràs and Helpman (2005).

set of policies, and then I will characterize the political equilibrium. I start by describing the general environment.

2.2.1 Environment

Consider an economy, closed to international trade for the time being, populated by a continuum of agents that consume a single final good, y. Preferences of the agents are defined as

$$U = y,$$

that is, preferences are linear, agents only care about total income.

The final good is produced by combining two intermediate goods, y^l and y^k, according to technology

$$y = \beta^{-\beta}(1-\beta)^{-(1-\beta)}\left(y^l\right)^{\beta}\left(y^k\right)^{1-\beta}, \tag{2.1}$$

where I define $\chi \equiv \beta^{-\beta}(1-\beta)^{-(1-\beta)}$. There are two groups of agents. First, a mass 1 of middle class producers, denoted by m, who have access to production opportunities and have each a fraction $(1-\delta^k)$ and $(1-\delta^l)$ of the total capital and land endowments, K and L. Second, a mass 1 of elite producers, e, who also have access to production opportunities, own each fractions δ^k and δ^l of the total capital and land endowments, and hold the political power.

Technology in each sector is given by ,

$$y_i^l = \alpha^{-\alpha}(1-\alpha)^{-(1-\alpha)}\left(l_i\right)^{\alpha}\left(z_i^l\right)^{1-\alpha} \tag{2.2}$$

$$y_i^k = \alpha^{-\alpha}(1-\alpha)^{-(1-\alpha)}\left(k_i\right)^{\alpha}\left(z_i^k\right)^{1-\alpha}, \tag{2.3}$$

where I define $\psi \equiv \alpha^{-\alpha}(1-\alpha)^{-(1-\alpha)}$ and y_i^h stands for production of individual i on sector h, k denotes capital, l land, and z is an intermediate input that fully depreciates after use.[5],[6] Notice

[5] z could be understood as units of final output. It is included so that the Laffer Curve is well defined. See the appendix for details.

[6] The analysis would go through for any two factors. I use capital and land for exposition purposes. The only important distinction is that one of the factors has to be mobile across countries for the analysis on Section 4 to go through. It should be noticed that capital here is not a factor that can be accumulated; this is a static set up, with a given original stock of capital. The implications of the forces at play in the model for capital

that the difference between both sectors is that in sector l production requires combining land and final output, while in sector k production requires combining final output and capital.[7] If a producer wants to use more capital or land than they own they can rent them on the factor markets. How much each group owns of the total factor stock will not play a role in determining the economic equilibrium, it will only matter for the political equilibrium. In what follows, factor prices will be denoted as r_h, $h = k, l$, for capital and land.

The political power in this model will be on the hands of the elite.[8] They have the ability to decide policies and choose those that benefit them the most. The only policies in this model consist of the ability to tax the activity of both intermediate sectors with a rate τ^h. Notice that there are no other fiscal instruments, only distortionary taxes, which will be the root for the inefficiency of policies. Again, we should interpret the concept of taxation in a broader sense: it could correspond to expropriation, or corruption, or any policy used by the elite to repress the middle class that translates into distortions in the economy.[9]

Revenue from taxation can be distributed across groups with targeted lump-sum transfers towards each group, $T^j \geq 0$. The government budget constraint is

$$T^m + T^e \leq \int_{h,i} \tau^h p^h y_i^h d_i d_h, \tag{2.4}$$

where p^h denotes the price of good h.

Finally, all markets are competitive.

2.2.2 Economic Equilibrium in the Closed Economy

An economic equilibrium is a set of intermediate and final good prices, p, p^l, p^k, factor prices r_k, r_l, investment levels and employment levels for all producers $\{k, z^h\}_{h=j,k}$, such that given a set of taxes, τ^l, τ^k, and p, p^l, p^k, r_k, r_l, all producers choose employment of factors optimally, good markets clear, and factor markets clear.

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accumulation are left for future research.

[7] The results in the paper would follow with more general technologies. In particular, I don't need to restrict capital and land to be used in one sector only. Also, the results would go through if I allowed for a third factor used in both sectors (labor for instance).

[8] For the analysis in this section, the economic equilibrium, who holds the political power will be irrelevant.

[9] The results would be similar with taxes on factors of production. I choose to have sectorial taxes for symmetry with my job market paper.

The problem for the final good producers is given by,

$$\underset{y^l, y^k}{Min}\ p^l y^l + p^k y^k \ s.t.$$
$$y \leq \chi \left(y^l\right)^{\beta} \left(y^k\right)^{1-\beta}.$$

This minimization yields the following relative demand equation,

$$\frac{y^l}{y^k} = \frac{\beta}{1-\beta}\frac{p^k}{p^l}, \tag{2.5}$$

Let us normalize $p = \left(p^l\right)^{\beta} \left(p^k\right)^{1-\beta} = 1$. Intermediate goods producers maximize profits taking the price and factor prices as given, which can be written as

$$\underset{h_i,\ z_i^h}{Max}\ \psi(1-\tau^h)p^h \left(h_i\right)^{\alpha} \left(z_i^h\right)^{1-\alpha} - r_h h_i - z_i^h, \tag{2.6}$$

where $h = l, k$. It is straightforward to show that the solution to this problem yields

$$h = \frac{\alpha p^h y^h (1-\tau^h)}{r_h} \tag{2.7}$$
$$z^h = (1-\alpha)p^h y^h (1-\tau^h), \tag{2.8}$$

where I drop the i because every producer invests the same. Looking at (2.7) and (2.8)we see that taxes discourage employment of factors. This is because producers are only able to recover a fraction of the productivity of the factors they employ.

The zero profit condition gives us the price level as

$$p^h = \frac{r_h^{\alpha}}{(1-\tau^h)}. \tag{2.9}$$

Finally factor markets have to clear,

$$K = k,\ L = l. \tag{2.10}$$

Notice that the FOC of the intermediate good producer with respect to z can be written

as

$$z^h = \frac{1-\alpha}{a}\left((1-\tau^h)p^h\right)^{1/\alpha} h,$$

and replacing this on the expression for output (2.2), output of intermediate sector h is given by

$$y^h = \frac{1}{\alpha}\left((1-\tau^h)p^h\right)^{(1-\alpha)/\alpha} h.$$

Now taking into account that sector h has to employ all the supply of factor h we get expressions (2.11) and (2.12).

$$y^l = \frac{1}{\alpha}\left((1-\tau^l)p^l\right)^{(1-\alpha)/\alpha} L \tag{2.11}$$

$$y^k = \frac{1}{\alpha}\left((1-\tau^k)p^k\right)^{(1-\alpha)/\alpha} K. \tag{2.12}$$

From this it is clear to see that the distortion is going to reduce total production in each intermediate good sector, which in turn will also reduce production of the final good. To see this, we can replace (2.11) and (2.12) on the expression for final output to find that total production in the economy is

$$y = \frac{1}{\alpha} L^{\beta} K^{1-\beta}\left((1-\tau^l)p^l\right)^{\beta(1-\alpha)/\alpha}\left((1-\tau^k)p^k\right)^{(1-\beta)(1-\alpha)/\alpha}. \tag{2.13}$$

Using the relative demand equation (2.5) together with (2.11) and (2.12), the relative price between sectors is given by

$$\frac{p^t}{p^k} = \left(\frac{1-\tau^k}{1-\tau^t}\right)^{(1-\alpha)}\left(\frac{K}{T}\frac{\beta}{1-\beta}\right)^{\alpha}. \tag{2.14}$$

Taxing sector h reduces relative supply for that sector, which is going to translate on a higher relative price for that intermediate good. But taxation not only distorts relative prices, but it also has a level effect on final output, as it can be seen on (2.13).

We can use the relative price together with the price normalization to solve for the price of

each sector as

$$\begin{aligned} p^t &= \left(\frac{1-\tau^k}{1-\tau^l}\right)^{(1-\beta)(1-\alpha)} \left(\frac{K}{T}\frac{\beta}{1-\beta}\right)^{(1-\beta)\alpha} \\ p^k &= \left(\frac{1-\tau^l}{1-\tau^k}\right)^{\beta(1-\alpha)} \left(\frac{T}{K}\frac{1-\beta}{\beta}\right)^{\beta\alpha}. \end{aligned}$$

Finally, factor prices can be found using the price equation, $r_h = ((1-\tau^h)p^h)^{1/\alpha}$. For later use, we can use the expressions for the price levels to solve for final output as a function of the tax rates,

$$y = \frac{1}{\alpha} L^{\beta} K^{1-\beta} \left((1-\tau^l)\right)^{\beta(1-\alpha)/\alpha} \left((1-\tau^k)\right)^{(1-\beta)(1-\alpha)/\alpha} \tag{2.15}$$

This concludes the description of the economic equilibrium.

2.2.3 Political Equilibrium under the Dictatorship of the Elite

I will now characterize the political equilibrium of this economy. I assume that political institutions correspond to a dictatorship of the elite, and the elite producers can choose those policies that benefit them the most. The only variables of choice for the government are the tax rates. As discussed previously, this can be interpreted broadly as expropriation, corruption, or other inefficient policies that translate into less investment and/or higher prices. Taxation is distortionary and there are no other means (in particular, no lump-sum taxes) to extract resources from producers.

A political equilibrium is a set of policies $\{\tau^k, \tau^l, T^m, T^e\}$ that satisfies the budget constraint for the government, (2.4), and maximizes the elites' utility. Given the linear preferences, this translates into maximizing total income, where income of the elite is defined as the sum of factor rewards and the transfer,

$$I^e = \delta^l r_l L + \delta^k r_k K + T^e, \tag{2.16}$$

It is straightforward to see that the elite will redistribute all of the revenues from taxation to themselves, so $T^m = 0$. Using this together with the government budget constraint, (2.4), the

problem for the elite reduces to

$$\underset{\tau^l,\tau^k}{Max}\ (\tau^l p^l y^l + \tau^k p^k y^k) + \delta^l r_l L + \delta^k r_k K$$

and after manipulating this equation (see appendix for details), the problem can be expressed as

$$\underset{\tau^l,\tau^k}{Max}\ \frac{1}{\alpha} L^{\beta} K^{1-\beta} \left((1-\tau^l)\right)^{\beta(1-\alpha)/\alpha} \left((1-\tau^k)\right)^{(1-\beta)(1-\alpha)/\alpha} \times \left[(\beta\tau^l + (1-\beta)\tau^k) + \alpha\left(\beta(1-\tau^l)\delta^l + (1-\beta)(1-\tau^k)\delta^k\right)\right]. \tag{2.17}$$

It is worth pointing out the similarities between this problem and the one in Segura-Cayuela (2006). In here, the elites would like to tax each sector at the peak of the Laffer Curve, $\tau^h = \alpha$. But taxing a sector reduces the value of the factor that is used on the production of that sector, limiting the elites from achieving that peak. The general equilibrium price effects of expropriation stop the elites from taxing at the peak of the Laffer Curve. In Segura-Cayuela (2006) something similar happened, but it work through the general equilibrium effects of prices on the profits that elites generated on their production activities.

The solution for this problem, although not explicit, is characterized in the following proposition,

Proposition 14 *The unique political equilibrium features $\tau^h > 0$ $h = t, k$, with $\tau^h > \tau^{h'}$ if and only if $\delta^h < \delta^{h'}$. Whenever $\delta^h = \delta^{h'}$ then is optimal to tax both sectors symmetrically.*

Proof. *See Appendix.* ■

Proposition 1 just states that the elites in power will set a higher tax rate on the sector that makes less intensive use (in this simple model no use at all) of the factor they own on a larger proportion. And the intuition for this is straightforward. Expropriating gives revenues to the elites, which follow the standard Laffer Curve. But the larger the distortion in the economy, the smaller are the rewards to factor prices. If the elites hold a larger share of the total capital endowment than they do of the land endowment, they want to tax sectors that make intensive use of capital by less than those that make intensive use of land, because they do not want the return to capital to go down too much as it is their main source of income. In other words,

they distort relative demand towards the good that uses capital on its production as to ensure a large return to it.

Corollary 15 *If* $\delta^k = \delta^l = 0$, *then* $\tau^h = \alpha \ \forall h$. *Also, if* $\delta^h > 0$ *and* $\delta^{h'} \geq 0$, *then* $\tau^h < \alpha$.

Proof. *Appendix.* ■

Corollary 1 states that if the elites do not own any of the factors of the economy, then it is optimal for them to achieve the peak of the Laffer Curve. But as long as they own either capital or land (or both) they will tax each sector at a lower level. The reason again is that taxing a sector affects the factor value through the general equilibrium, and this limits them from going all the way to the peak of the Laffer Curve. Also, notice that even when $\delta^h = 0$ and $\delta^{h'} > 0$ it is not optimal to achieve the peak of the Laffer Curve for sector h, that is, to set $\tau^h = \alpha$ and $\tau^{h'} = 0$. The reason again is that taxing sectors differently distorts the relative allocation of resources and is less costly to set $\tau^h < \alpha$ and $\tau^{h'} > 0$.

This result has a similar flavor than that of Segura-Cayuela (2006). In there, the difference was that the general equilibrium was reducing the profits that the elites achieved on their production activities, and that stopped them from achieving the peak of the Laffer Curve, while here it is through the effect on the value of the factors they own.

From these results and looking at (2.14) it follows that what is going to matter to determine the relative price of the two sectors is not only the relative factor endowment, but also the relative factor endowment of the elites, as it is going to be the determinant of the relative expropriation rates on each sector.

2.3 Opening the Economy to International Trade

This section modifies the previous framework by allowing international trade on intermediate goods. This exercise should be understood as an exogenous opening to international trade, either because of a decrease in transport costs or because the IMF forces the developing economy to do so.

I analyze what happens if an economy with the equilibrium expropriation levels of the closed economy opens to trade and those equilibrium levels do not change. The purpose of this is to look at how those distortions affect the patterns of trade that we would predict with standard

factor endowment driven comparative advantage trade theory. That expropriation levels stay unchanged can be justified by the persistence of economic institutions.[10] Notice the difference with what is done in Segura-Cayuela (2006). In that paper I analyze the effect that trade opening has on the efficiency of institutions. In the current paper instead I look at the effect that those inefficiencies have on the patterns of trade for a given set of inefficiencies.

The main result will be that looking at relative factor endowments of an economy to predict the factor content of trade may be misleading, as relative expropriation rates can more than compensate for factor endowment driven comparative advantage.

I assume a small open economy that has access to world markets for goods k and l.[11] These goods sell at prices p^{k*} and p^{l*}, and are produced with the same technologies in the rest of the world. Also, institutions in the rest of the world are such that no expropriation happens in equilibrium. That means that the relative price in the rest of the world is given by

$$\frac{p^{l*}}{p^{k*}} = \left(\frac{K^*}{L^*}\frac{\beta}{1-\beta}\right)^{\alpha}.$$

Assume for simplicity that the relative size of the sectors is equal to the relative factor endowment, $K^*/L^* = (1-\beta)/\beta$. This implies that the relative price in the rest of the world is going to be 1. As in Segura-Cayuela (2006) the reason for this is to abstract from any other source of comparative advantage other than the differential rates of expropriation across sectors.

Let us proceed by discussing the equilibrium and the pattern of trade.

2.3.1 Economic Equilibrium with unchanged expropriation

An economic equilibrium is a set of intermediate and final good prices, p, p^l, p^k, factor prices r_k, r_l, investment levels and employment levels for all producers $\{k, z^h\}_{h=j,k}$, such that given a set of taxes, τ^l, τ^k, and p, p^l, p^k, r_k, r_l, all producers choose employment of factors optimally, good markets clear, and factor markets clear.

Notice that now the only difference with the closed economy is that prices are given by the world economy, p^{k*} and p^{l*}. Given that each factor is only used in one sector, relative factor

[10] If I solved for the equilibrium levels of expropriation on the open economy the result would be similar to that in Segura-Cayuela(2006).

[11] The small open economy assumption only simplifies the analysis and does not drive the main result.

prices are also going to be equalized with the rest of the world. To see that, notice that when the country opens to trade, in equilibrium it has to be the case that,

$$1 = \frac{p^{*l}}{p^{*k}} = \left(\frac{1-\tau_c^k}{1-\tau_c^l}\right)\left(\frac{r^l}{r^k}\right)^{\alpha},$$

or solving for the relative factor return,

$$\frac{r^l_{trade}}{r^k_{trade}} = \left(\frac{1-\tau_c^l}{1-\tau_c^k}\right)^{1/\alpha}.$$

This is the only change with respect to the equilibrium in the closed economy. Given p^{*l}, p^{*k}, r^l_{trade} and r^k_{trade}, all the equations that defined equilibrium employment levels and output on the closed economy as a function of prices define also the equilibrium with an open economy.

To analyze the factor content of trade, remember that the relative price in the closed economy is given by

$$\frac{p^l}{p^k} = \left(\frac{1-\tau_c^k}{1-\tau_c^l}\right)^{(1-\alpha)}\left(\frac{K}{L}\frac{\beta}{1-\beta}\right)^{\alpha},$$

where τ_c^h are the equilibrium levels of taxation from the closed economy. Combining the relative price equation with (2.9) we can solve for the relative factor return as

$$\frac{r^l}{r^k} = \left(\frac{1-\tau_c^l}{1-\tau_c^k}\right)\left(\frac{K}{L}\frac{\beta}{1-\beta}\right).$$

To simplify the analysis consider the case in which $K/L = (1-\beta)/\beta$, that is, the small open economy has the same relative factor endowments as the rest of the world. This means that in a model without expropriation our economy would be a reduced scale version of the world economy, and there would not be any reason to trade.

With expropriation, what determines the relative price across sectors in the closed economy is now the relative taxation level. That means that before opening to trade our economy had a lower price on the good that uses the factor for which the elite has a larger relative endowment, as taxation on that sector is lower. And the reason is simple, the good with a lower relative tax rate has a larger relative supply, which translates on a smaller relative price. And it also implies a higher relative reward for that factor, as the demand for it increases.

Allow me to discuss the case in which the elites are landowners (they own relatively more land than capital). In this case we know that $\tau^l < \tau^k$. This implies that the country is going to be a net exporter of goods that use land intensively, despite not having a factor endowment driven comparative advantage. Notice also that if we compare relative factor rewards with and without trade, the relative return of land increases.

Once we depart from the case $K/L = (1-\beta)/\beta$ the results are a combination of the relative factor endowment of the economy and the relative factor endowment of the elites.[12] In this case, the economy becomes a net exporter of goods that use land (land being the factor the elites own on a larger share) if

$$\frac{1-\tau_c^k}{1-\tau_c^l} < \left(\frac{K}{T}\frac{\beta}{1-\beta}\right)^{\alpha/(1-\alpha)},$$

that is, if the relative expropriation rate compensates for the relative abundance of that factor in the economy. And notice that the optimal expropriation rates are independent of the relative factor endowment of the economy, which means that the effect coming from the relative endowment of the elites can more than compensate for the effect of the relative endowment of the economy. In other words, it could be the case that, as long as the elites own a large enough share of that capital, an economy which is abundant in land ends up being a net exporter of goods that use capital intensively. The next proposition summarizes the results,

Proposition 16 *If the relative factor endowment of the elites is aligned with that of the economy, then the country always exports the good that makes intensive use of the relatively abundant factor. If the relative factor endowment of the elites goes against that of the economy, then the country may end up being a net exporter of the good that makes intense use of the relatively scarce factor.*

Proof. *In text.* ■

The result in Proposition 2 has the implication that, by looking at relative factor endowments of an economy without taking into account the relative endowments of the elite, we could predict the wrong content of factor trade. In particular, if the elites have enough of the scarce

[12] Although as we dont have an explicit solution for the relative expropriation levels, the general case is harder to characterize.

factor in the economy relative to the other one, they are going to expropriate the abundant factor much more than the scarce one, reverting factor endowment driven comparative advantage. This by itself could be an explanation of the Leontieff paradox if we believe that elites in developing economies with weak institutions tend to control a smaller share of the more abundant factor. Whether this is relevant empirically is something I leave for future research. The next Corollary just follows from the previous discussion,

Corollary 17 *The country is more likely to be a net exporter of the good that makes intensive use of the factor the elites own on a larger share.*

This Corollary just states that elites can take advantage of their political power to revert factor endowment driven comparative advantage, and export the goods that use intensively the factors they own in relatively more abundance.

One could think the story of Spain during the Stabilization Plan under the dictatorship of Franco is similar to this: Spain had a clear comparative advantage on the production of textiles just before the Civil War started, while agriculture, despite the abundance of land, was obsolete, and inefficient. The land owners, "terratenientes", were closely linked to the Franco regime and believed to give him economic support when the regime needed it. The textile sector was mainly concentrated in Catalonia, region that fought against the Franco regime and was clearly not a member of the political elites. After the war and with the beginning of the stabilization plan and trade, Spain started exporting more and more agricultural products while the production of textiles decreased dramatically.

2.4 Opening the Economy to International Capital Markets

I now close the economy to international trade and analyze what would happen if that economy opened to International Capital Markets, again exogenously. As in the case with international trade, I take expropriation rates as given by the closed economy.

Without the political economy ingredient, this simple model would predict that capital would fly from capital abundant countries to countries where capital was an scarce factor.

When we take into account the equilibrium expropriation rates, remember that the relative

factor price in the closed economy is given by

$$\frac{r^k}{r^l} = \left(\frac{1-\tau_c^k}{1-\tau_c^l}\right)\left(\frac{L}{K}\frac{1-\beta}{\beta}\right)$$

Assume again $K^*/L^* = (1-\beta)/\beta$, that is, the relative factor price for the rest of the world is 1. If our economy has the same relative factor endowments as the rest of the world, relative factor prices are just going to be determined by relative taxation, which in turn is determined by the relative factor endowment of the elites. If the elites are relatively more endowed with land, they are going to set a higher relative tax on the good that is produced making intensive use of capital, which means that the relative return of capital is going to be lower than in the rest of the world. This in turns implies that capital is going to fly away from the country to the rest of the world, until relative returns are equalized. If the elites are instead capitalist, they are going to attract capital to the country, until returns are equalized.

Once we depart from the case where $K/L = (1-\beta)/\beta$ the results are again a combination of relative factor endowments and relative rates of expropriation. For capital to fly away we need $r^k/r^l < 1 = r^{*k}/r^{*l}$or

$$\left(\frac{1-\tau_c^k}{1-\tau_c^l}\right) < \left(\frac{K}{L}\frac{\beta}{1-\beta}\right).$$

This means that even if the country is capital abundant, if the elites own a large enough share of capital relative to land, they are going to tax land relatively more, which can drive the relative return of capital above that of the world. If instead they own a larger share of land than capital, then the return of capital is going to be below that of the world. Again, by looking at relative factor endowments of an economy to predict capital flows we could predict the wrong direction, as the relative factor endowment of the elites can revert that. The following Proposition summarizes the results,

Proposition 18 *If the relative factor endowment of the elites is aligned with that of the economy, then the direction of capital flows can be reverted compared to a model without expropriation. In particular, a capital abundant country may be receiving capital while a land abundant country may be losing it.*

Proof. In text. ■

Again, whether this proposition is something empirically relevant is something I leave for future research, but one could think of Western Africa as an example of this. Most of the countries in the region are land (and natural resources) abundant and most of it is on the elites hands, which could be leading to high expropriation rates on capital that stops it from going to those countries.

Also, a straightforward implication of the result is that countries where the elites are capitalist are more friendly, other things equal, to capital. Thus, we should observe higher returns to capital and more capital inflows to developing economies where the elites are (relatively) capitalists, than to those where the elites are (relatively) land owners.

2.5 Conclusions

In this paper I extend my work in Segura-Cayuela (2006) to explore the implications of factor endowments of an economy with weak institutions and how they differ with the elites' factor endowments, on the treatment that those factors receive by the elites, and how this shapes international trade and capital flows.

I showed that in a closed economy the elites always expropriate more the sector that makes less intensive use of the factor they own on a larger share. I then analyzed what were the implications of that both for exogenously opening to international trade or international capital markets.

Opening to trade in this context can lead to very different predictions from the standard model without expropriation. By looking at relative factor endowments of an economy without taking into account the relative endowments of the elite, we could predict the wrong content of factor trade. Because the elites always expropriate more from sectors that use the factors they own in less proportion, if the elites have enough of the scarce factor in the economy relative to the other one, they are going to expropriate the abundant factor much more than the scarce one. This effect can be large enough as to revert factor endowment driven comparative advantage. It also implies that countries with weak institutions tend to export goods that make abundant use of the factors controlled mostly by the elites.

In the case of international capital markets, by looking at relative factor endowments of

the economy only, we could predict the wrong direction of capital flows. In particular, if in a capital abundant country most of the capital is controlled by the elites, they are going to tax capital intensive sectors relatively less than others, which may revert relative factor prices and lead to capital inflows to the country.

This paper has abstracted from dynamics for simplicity. But it would be extremely interesting to understand the implications of the mechanism at play in this paper for capital accumulation and growth, which should be the next step. Also, this is a first step to understand the discussion that Barrington Moore makes about the role of the middle class on modernization and the rise of democracy. Of course to progress on those lines the next step would consist on endogenizing political institutions, and understand how different types of elites and middle class (different in their factor endowments) lead to different paths of democratization and modernization of the economy. In particular it would be interesting to try to explain the different paths experienced by South America, with land owner elites, and East Asia, with the power on the hands of capitalists.

Finally, this paper has interesting predictions to be tested empirically. In particular, one could try to build a measure of relative factor endowment of the elites of a country and replicate factor content of trade empirical exercises, like the one in Romalis (2004), and see how much of the Leontieff Paradox or the Missing Trade can be explained by this new ingredient. Also, a reduced form of the implications of this model could be captured with sector augmenting productivity parameters, where the sector augmenting productivity differences captured the relative abundance of those factors for the elites. It would be interesting to look at how much of the productivity differences between the North and the South can be explained through this new ingredient.

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2.6 Appendix A: Detailed solution of the model and Proofs

2.6.1 Final Good as an Intermediate input

As discussed on the main text, the assumption that the final good is used as an intermediate input for the production of intermediate goods generates enough concavity for the political economy problem to be well defined. To see this, replace z by y on the production function for intermediate goods, and then replace that on final goods. The final expression for final output (ignoring taxation) is then given by

$$y = K^{\beta\alpha/(1-\alpha)} L^{(1-\beta)\alpha/(1-\alpha)}.$$

This implies that taxation on the intermediate goods sector not only distorts the relative demand of sectors, but it also has a level effect on final output.

To see this notice that this assumption implies that the amount of final good available for consumption is

$$\widehat{y} = y - z^k - z^l = y - (1-\alpha)(1-\tau^k)p^k y^k - (1-\alpha)(1-\tau^l)p^l y^l,$$

or replacing by the relative demand equation

$$\widehat{y} = (1 - (1-\alpha)(\beta(1-\tau^l) + (1-\beta)(1-\tau^k))y,$$

which gives us the desired level effect of taxation so that we get a properly defined Laffer Curve. Without this level effect, taxing both sectors at the same level would always undo the distortionary effect of taxation and the problem would not be properly defined.

Finally, equilibrium in the goods market requires total income to be equal to total expenditure $\widehat{y}$. And total expenditure is

$$E = r_l L + r_k K + \tau^l p^l y^l + \tau^k p^k y^k,$$

and using the first order conditions for the intermediate goods producers and the relative demand equation, it is easy to check that $E = \widehat{y}$.

2.6.2 Elite's Income

Total income of the elite is given by

$$(\tau^l p^l y^l + \tau^k p^k y^k) + \delta^l r_l L + \delta^k r_k K.$$

Using the relative demand equation we can write this as

$$\frac{1}{\beta}(\beta\tau^l + (1-\beta)\tau^k)p^l y^l + \delta^l r_l L + \delta^k r_k K.$$

Now replacing $r_h H$ with the FOC we get

$$\frac{p^l y^l}{\beta}\left[(\beta\tau^l + (1-\beta)\tau^k) + \alpha\left(\beta(1-\tau^l)\delta^l + (1-\beta)(1-\tau^k)\delta^k\right)\right].$$

Finally, using that $p^l y^l = \beta y$ and replacing by the expression for total output we get equation (2.17) on the main text.

2.6.3 Proof of Proposition 1

Allow me to reduce the problem by defining

$$\begin{aligned} A &\equiv \left((1-\tau^l)\right)^{\beta(1-\alpha)/\alpha}\left((1-\tau^k)\right)^{(1-\beta)(1-\alpha)/\alpha} \\ C &\equiv \left[(\beta\tau^l + (1-\beta)\tau^k) + \alpha\left(\beta(1-\tau^l)\delta^l + (1-\beta)(1-\tau^k)\delta^k\right)\right] \end{aligned}$$

The FOC for this problem are

$$\begin{aligned} (\tau^t) &: -\beta\frac{1-\alpha}{\alpha}\frac{A*C}{(1-\tau^l)} + \beta * A * \left[1-\alpha\delta^l\right] = 0 \\ (\tau^k) &: -(1-\beta)\frac{1-\alpha}{\alpha}\frac{A*C}{(1-\tau^k)} + (1-\beta) * A * \left[1-\alpha\delta^k\right] = 0. \end{aligned} \tag{2.18}$$

Notice first that this is a well behaved problem with a solution such that both tax rates are positive. Also, as long as $\delta^l \neq \delta^k$ we will not have an equilibrium where both tax rates are the same. The equilibrium relation between τ^l and τ^k is determined by

$$-\frac{\alpha C}{1-\tau^l}+\left[1-\alpha\delta^l\right]=-\frac{\alpha C}{1-\tau^k}+\left[1-\alpha\delta^k\right].$$

Notice that this immediately implies that whenever $\delta^h > \delta^{h'}$ then it has to be the case that $\tau^h < \tau^{h'}$. Also, if $\delta^h = \delta^{h'}$ then it has to be the case that $\tau^h = \tau^{h'}$. This completes the proof.

2.6.4 Proof of Corollary 1

That $\tau^h = \alpha \ \forall h$ when $\delta^h = 0 \ \forall j$ it follows from replacing $\delta^h = 0$ on the $FOC's$ and solving for τ^h. To see that $\tau^h < \alpha$ if $\delta^h > 0$ notice from the first order condition for τ^h that the positive term goes down as δ^h increases, while the positive term increases. From this it follows that τ^h has to be smaller than α.

Chapter 3

Inefficient Policies, Inefficient Institutions and Trade: An Empirical Analysis

Summary 19 *In this paper I provide an empirical analysis of the main mechanism in Segura-Cayuela (2006) that argues that part of the reason why many developing economies experienced poor economic performance in the last 40 years despite more integration to the global economy may be related to the interaction between weak institutions and trade: Trade openness exacerbates the rent seeking activities of the elites in power in non-democratic regimes. In particular, using a panel of 92 countries and 17 years I show that non-democratic countries that trade more also experience more expropriation, while this is not the case for democratic regimes. The results are robust to different econometric specifications and different sets of controls.*

3.1 Introduction

That trade is good for economic performance has been emphasized for a long time by the literature. Figure 1 gives a sense of that: countries that traded more between 1960 and 1995 appear to have larger per capita incomes today. But if we take a closer look at that picture, that story may not sound that convincing. Figure 2 splits Figure 1 in two, one for countries with strong political institutions and another for countries with weak political institutions. The positive relation between trade and income per capita still holds for countries with more democratic political institutions, but the relationship is gone for countries with weak political institutions. Thus, one may be tempted to think that the benefits from trade differ across countries with different political institutions.

It could be argued that the differences in economic performance between countries with different political regimes are unrelated to globalization. But in Segura-Cayuela (2006) I argue that part of the reason for the poor economic performance of some developing economies, despite their integration to the world economy, may be related to the interaction between trade opening and the weakness of political institutions. In particular, I construct a model in which trade opening in societies with weak institutions (in particular autocratic and elite-controlled political systems) may lead to worse economic policies.[1] The reason is that general equilibrium price effects of taxation and expropriation in closed economies also hurt the elites, and this puts a natural barrier against inefficient policies. Trade openness removes this barrier and enables groups with political power to exercise this power in more inefficient ways.

The goal of this paper is to provide some empirical evidence on the existence of the forces at play in Segura-Cayuela (2006). Using data on governance, trade, and democracy I look at the effect that trade has on expropriation controlling for the weakness of the political system. According to the theoretical model, non-democratic regimes should experience an increase in expropriation when they are more open to trade, while there should not be an effect for democratic regimes.

Any empirical work based on cross-country relationships suffers from the standard problems of reverse causality and omitted variable biases. In the results we could capture the effect that

[1] Segura-Cayuela (2006) is based on Acemoglu (2005).

the dependent variable has on the explanatory variable, or some other factors omitted from the regression could be affecting trade, democracy and expropriation, biasing the findings.

To address these issues I utilize two strategies. First, I use panel data and include country fixed effects to control for omitted variables. This approach is only valid if the omitted factors that affect expropriation trade and democracy do not change over time. To partly correct for that I also include time fixed effects and the interaction of them with regional variables. The main finding of this approach is that, while democratic regimes experience an improvement on expropriation when they trade more, non-democratic regimes suffer a deterioration, a result on the lines of what the theoretical model on Segura-Cayuela (2006) predicts. And the result is robust to different estimation techniques and sets of controls. In particular, to deal with potential biases that may arise with Ordinary Least Squares when including lagged dependent variable on the right hand side, I also use Arellano and Bond (1991) Generalized Method of Moments estimator, obtaining similar results.

To address reverse causality and omitted variables biases, and following Giavazzi and Tabellini (2005), I then follow a difference-in-difference approach with panel data, where the treatments are the dates of liberalization and democratization. For countries that only experienced trade liberalization during the sample period, I look at the differential effect of liberalizing to trade on expropriation for democratic and non-democratic countries. Also, for countries that undertook both reforms during the sample periods, I look at the differential effect of liberalizing to trade on expropriation for those countries that democratized before opening to trade and those that opened to trade before democratizing.

The results with this approach will provide mixed evidence. For countries that undertook just one reform expropriation decreased, irrespective or whether they were democratic or not, but the improvement on expropriation was smaller for those that were less democratic. Notice that the theoretical model predicts that expropriation should increase for countries with weak institutions and not change for countries with strong institutions. The result, despite not being perfect, provides evidence on the same direction of the model, a larger improvement for more democratic regimes. On the other hand, for countries that undertook both reforms the effect of opening to trade on expropriation is not significantly different.

The main contribution of this paper is to provide evidence on the differential effect of trade

opening on expropriation for different political institutions. Stronger evidence would probably require structural analysis and better data. I discuss in the empirical section the limitations on the data available, measures of governance and expropriation are subjective, reflecting outcomes and not incentives, and varying little year-by-year. The lesson from this is that, to further address the validity of the relevant forces in the theoretical model (and, for that matter, the same applies to any empirical exercise that uses governance variables) more work needs to be done.

The rest of the paper is organized as follows. Section 2 presents a discussion of the results in Segura-Cayuela (2006) to be tested. Section 3 describes the data. Section 4 presents the Fixed Effects econometric approach and presents the results under different estimation techniques and for different sets of additional controls. In section 5 I discuss the Difference in Difference approach together with its results. Finally Section 5 concludes and discusses future lines of research.

3.2 The Theoretical Prediction

In my previous work I argue that part of the reason why less-developed economies may not have benefited from international trade is that, in countries with weak or non-democratic political institutions, trade liberalization may lead to worse policies and economic institutions. The reasoning is simple: in a closed economy, groups that hold political power are restrained in the degree to which they may indulge inefficient redistributive policies, such as corruption or expropriation, because of the general equilibrium price effects such policies create. Increased international trade removes these price effects, and may increase the intensity of rent-extracting policies. On contrast, under a democracy, which incorporates workers in the decision making process, because workers participate in all sectors they have preferences more aligned with the economy, and the general equilibrium effect will not restrain them from achieving their desired expropriation rates. When the country opens to trade, workers will set the same expropriation rates as in the closed economy, and opening to trade will not have a negative effect on the efficiency of policies.

Thus, I will be looking at the differential effect that trade has on expropriation for different

political regimes. To do so, I will use an unbalanced panel of 92 countries with yearly data from 1984 to 2000. The list of countries is described on Table 3. The econometric approaches are explained in Sections 4 and 5. I now proceed to describe the data

3.3 Data

3.3.1 Reforms

The data on reforms comes from two sources. For trade liberalization I use the trade liberalization dates provided in Wacziag and Welch (2003), which update those in Sachs and Warner (1995) to the year 2000. A country is classified as being open to trade when 5 criteria are met: Average tariffs do not exceed 40 %; non-tariff barriers do not cover more than 40 % of trade; the black market premium on the exchange rate does not exceed 20%; most of the exports are not controlled by a state monopoly; and it does not have a socialist economic system. Notice the first problem in looking at the effects of my model. When a government intervenes too much in an economy, either with non-tariff barriers or by controlling the exports market, the country is considered to be closed to trade. What the model predicts is precisely that trade liberalization would lead to more intervention for non democratic regimes. Thus, the definition of the reform process is already closing some of our avenues of exploration. The relevant question is whether state intervention is carried out with the purpose of stopping trade or extracting rents. If it is the former, then the definition should not affect the results, but if it is the latter the results should be biased downward.

The reason for these criteria derives from arguments like infant industry protection. But most African economies, for instance, combine those infant industry protection policies with extreme restrictions in access to exports markets and capital markets and heavy taxation for domestic companies in those protected sectors. To my understanding this is a clear case of rent extraction, both from domestic and foreign companies.

To construct the democratization treatment, I follow Giavazzi and Tabellini (2005). A country is assumed to transition from non-democracy to democracy if the variable POLITY 2 from the POLITY IV data set jumps from negative to positive values. POLITY 2 is a variable based on POLITY 1 that has been defined precisely to detect changes in regime. POLITY

1 is a measure of the quality of political institutions that goes from -10 (strongly autocratic) to +10 (strongly democratic). This definition of transition to democracy is standard in the literature. I will also use POLITY 2 as my measure of democracy (normalized to be between 0 and 1) when using the first specification detailed in Section 4, and to construct a dummy for democracy (a country is considered to be democratic if the normalized variable is larger that 1/2) when using the second specification explained in Section 4.

3.3.2 Governance

For measures of the extent of expropriation I use the variable protection against expropriation from the International Country Risk Guide. This data is available between 1984-2000, which limits the size of my sample. Protection against expropriation is coded from 0 to 10 from no protection to full protection. Thus, we should interpret a positive coefficient as a decrease on expropriation. The variable is normalized to be between 0 and 1.

The problem with this variable is that it is a subjective measure based on the opinion of experts on the subject. As discussed by Glaeser et al (2004), this measure (and other institutional measures in the same data set) tends to reflect outcomes more than ex-ante incentives. For instance, Iran, Libya, and Syria all moved from levels of extreme expropriation (1 and 1.5) to almost perfect scores (9) during the sample period, while no major political development happened in those countries in all that time. This again makes the analysis harder, as it also biases the effects downwards.

3.3.3 Other Variables

To measure trade I use the log of total trade volume (exports plus imports) as a share of GDP, from the Penn World Tables. Human capital, investment, GDP, labor force size, and population are taken from the World Development Indicators data set.

3.4 Fixed Effects Approach

The first basic regression model is

$$y_{it} = \mu_t + \delta_i + \eta y_{it-1} + \alpha Trade_{it-1} + \gamma Democracy_{t-1} + \lambda Trade_{it-1} \times Democracy_{t-1} + X'_{it-1}\beta + \varepsilon_{it}, \tag{3.1}$$

where y_{it} is protection against expropriation on country i at time t, μ_t and δ_i are time and country fixed effects, $Democracy_{t-1}$ is a continuous measure of how democratic the political regime of a country is, $Trade_{it-1}$ is the volume of trade as a share of GDP, and X_{it} are additional control variables. The lagged value on protection against expropriation is included as an explanatory variable to capture its persistence and mean reverting dynamics.

Notice that I am including country fixed effects. This should correct for the omitted variables bias as long as those omitted variables that affect the left hand side variable and the treatments do not change over time. To control for common unobservables that might move over time I also include year fixed effects and interactions of regional dummies for Africa, Asia and Latin America with year dummies.

The trade and democracy variables are continuous. And this is because, despite the model in Segura-Cayuela (2006) comparing totally democratic and non-democratic regimes under no trade and free trade, the degree of democratization and openness differs in a continuous fashion across countries and one should expect the effects to vary in a non discrete way to some extent.

In principle we should expect γ to be positive, more democratic countries have less expropriation. There is not a clear prior on what the effect of trade by itself should be. The coefficient of interest for my purposes is λ which measures the interaction between trade and democracy. If α is positive, we should find λ to be positive too, that is, trade increases protection against expropriation, and it does that more for more democratic regimes. If α is negative, again we should expect λ to be positive and large enough so that protection against expropriation does not get worst for more democratic regimes.

The specification below assumes linearity on the interaction between trade and democracy, and precisely in my theoretical paper I emphasize the differential effect that trade has on incentives under different political regimes, which is unlikely to be captured by a linear relationship. To try to capture some of the non-linearity I introduce an additional variable, a dummy that

takes the value of one if the country is democratic (the country has a democracy score above 0).[2] The specification is then

$$\begin{aligned} y_{it} &= \mu_t + \delta_i + \eta y_{it-1} + \alpha Trade_{it-1} + \gamma Democracy_{t-1} + \\ &\quad \lambda Trade_{it-1} \times Democracy_{t-1} + \theta Trade_{it-1} \times D_{t-1} + X'_{it-1}\beta + \varepsilon_{it}, \end{aligned} \tag{3.2}$$

where D_{t-1} is a dummy variable that takes the value of 1 for democracies. What this specification is doing is to allow for some monotonicity by including the interaction between the two continuous variables, while capturing the fact that there is a non monotonic difference on the effect that trade has on expropriation for different political regimes. The effect of interest is now

$$\frac{\partial y_{it}}{\partial Trade_{it-1}} = \alpha + \lambda Democracy_{t-1} + \theta D_{t-1}, \tag{3.3}$$

which allows more flexibility that (3.1) .

Standard errors in all estimations are robust and clustered at the country level to correct for correlation over time. The first column in Table 1 shows the results for the specification in (3.1) , that is, the fixed effect OLS estimation with continuous measures of trade and democracy, without the dummy for democracy. The coefficient on the lag of expropriation confirms the persistence of the measure. The coefficient on democracy is positive, and significant at 1%: more democratic regimes have better protection against expropriation which is something we should expect a priori. Also, trade does not seem to have an effect on expropriation. Finally, the coefficient of interest, that of the interaction between trade and democracy, is negative and significant at 5%. Notice that from the theory we would predict it to be positive, countries that are more opened to trade should have less expropriation the more democratic they are. But as discussed before, the model in Segura-Cayuela (2006) predicts a non-monotonic relationship for the effect of trade opening on expropriation for different political regimes.

Column 2 on Table 1 shows the results of incorporating the dummy variable to try to capture some of those linearities. Notice first that the coefficient on democracy is still positive and significant at 1%, more democratic regimes still experience less expropriation. Second, the coefficient on trade is still not significant. Also, the coefficient on the interaction between

[2]To consider a democracy when the democracy score is positive is standard in the literature.

trade and democracy is still negative and significant at 10%, and much larger than before, while the coefficient on the interaction between trade and the democracy dummy is positive and significant at 5%. What does that mean? Remember that the effect of interest is given by (3.3), which means that for non-democratic regimes the total effect is

$$\left.\frac{\partial y_{it}}{\partial Trade_{it-1}}\right|_{D_{t-1}=0} = -0.050 \times Democracy_{t-1}.$$

that is, non-democratic regimes that trade more experience more expropriation, which is on the lines of what the model en Segura-Cayuela (2006) predicts.

For democratic regimes the total effect is given by

$$\left.\frac{\partial y_{it}}{\partial Trade_{it-1}}\right|_{D_{t-1}=1} = -0.050 \times Democracy_{t-1} + 0.052.$$

Remember that these countries are the ones with normalized democratic scores between $\frac{1}{2}$ and 1. That means that opening to trade improves protection against expropriation for them, as the total effects are on the range $(0.02, 0.27)$. Also, the more democratic a country is, the smaller is the benefit on expropriation from larger trade volumes.

To sum up, the data confirms that non-democratic countries that trade more experience more expropriation, while democratic regimes benefit from larger trade volumes, which is what we would expect from the theoretical model.

A concern about the specification in (3.2) is that it includes the lagged value of expropriation as an explanatory variable, which can potentially lead to biased estimates. To deal with those biases I use the Generalized Method of Moments methodology described in Arellano and Bond (1991). If we time difference equation (3.2) we get

$$\begin{aligned}\Delta y_{it} = \eta \Delta y_{it-1} + \alpha \Delta Trade_{it-1} + \gamma \Delta Democracy_{t-1} + \\ \lambda \Delta (Trade_{it-1} \times Democracy_{t-1}) + \theta \Delta (Trade_{it-1} \times D_{t-1}) + \Delta X'_{it-1}\beta + \Delta \varepsilon_{it},\end{aligned}$$

This equation can't be estimated consistently with OLS, but if the residuals $\Delta \varepsilon_{it}$ do not present second order serial correlation, or in other words, all lags y_{it-j}, $j \geq 2$ are uncorrelated with the residuals, we can use those lags as instruments for Δy_{it-1}.

Column 3 of Table 1 presents the results of this approach. Notice first, that the test $AR(2)$ indicates that there is no further serial correlation. Second, the *Hansen J* test of overidentifying restrictions is not rejected, validating the approach. The results are similar to the ones found above, but all coefficients increase in magnitude. Democracy is still an important determinant of expropriation. The surprising result is that now trade has a direct and negative effect on protection against expropriation: countries that trade more are less protected against expropriation. As discussed before, from the model in Segura-Cayuela(2006) there is not a prior about what the direct effect of trade on expropriation should be, the prediction is about the interaction between trade and democracy, but the result is interesting by itself.

With respect to the effect of interest, the coefficients on the interactions of trade with the democracy variables, the coefficient on the interaction between the dummy for democracy and trade is now positive and twice the size of that on the interaction between democracy and trade, which is still negative, reinforcing the results found above. But the result now requires a qualification. Because now the direct effect of trade on expropriation is negative and significant, the total effect of trading more is given by

$$\frac{\partial y_{it}}{\partial Trade_{it-1}} = -0.308 - 0.107 \times Democracy_{t-1} + 0.210,$$

which means that even for democratic regimes, the total effect of trade is negative, trade increases expropriation, but less than for non-democratic regimes.

Finally, Columns 1 to 6 on Table 2 present the results of adding additional control variables as a robustness check for the result found on Column 2 of Table 1. Those additional controls are GDP per worker, investment, human capital, population size, and labor force size. Columns 1 to 5 add each of these controls one by one, while Column 6 features all of them.

The main result is robust to the inclusion of those additional controls: the coefficient on the interaction between trade and the continuous democracy variable remains negative and significant, and the coefficient on the interaction between trade and the democracy dummy stays positive, significant, and larger in absolute value than the other one.

Also, adding those additional controls shows some interesting results. Larger human capital, investment, size of the population, and size of the labor force are all associated with better

protection against expropriation, as is seen in Columns 1, 3, 4 and 5 respectively. The surprising result is that GDP per capita seems to be positively correlated with expropriation, although the coefficient is not significant.

3.5 Difference-in-Difference Approach

The second approach is based on Giavazzi and Tabellini (2005). To address reverse causality and omitted variables biases I will follow a difference-in-difference approach with the same panel of countries. I am principally interested in the effect that trade liberalization has on the efficiency of dictatorial economies compared to what happens with democratic regimes. The treatments will be liberalization and democratization. The theoretical model tells us that the effect of trade liberalization on efficiency is negative for countries with weak political institutions and none for countries with strong political institutions (democracies). I will be looking at whether countries that liberalized trade without democratizing present an increase in inefficiency. Also, for countries that undertook both reforms, I will be looking at whether countries that liberalized trade first also experienced increased inefficiency after this first reform.[3] I analyze the impact of both liberalizations on protection against expropriation

The simplest specification to look at the predictions of our model would be to define two treatments, one for liberalization and one for democratization, and look at the coefficient on the interaction of both. But if two countries only liberalized to trade in the sample period, and one of them was democratic and the other autocratic, we would be estimating the same effect of trade liberalization on the dependent variable for both countries. Also, for two countries that undertook both reforms in the sample period but in different order, the same problem arises. A solution could be to restrict the sample to countries that were originally closed and only liberalized to trade during the sample period, and look at the differential effect of opening to trade between autocratic and democratic regimes. But this procedure would reduce the sample size by a large number, not many countries started the period closed to trade and only undertook this reform. Instead, what I do is to use the whole sample of countries, and define enough treatments, so that I can estimate the effects of liberalizing trade differentiating by the

[3]The next section contains a detailed explanation of the treatment groups.

original conditions of the country. I define the following set of treatments:

1.- Countries that were closed and autocratic at the beginning of the sample period and opened to trade. We define a dummy variable that takes the value of 1 after that reform.

2.-Countries that were closed and autocratic at the beginning of the sample period and democratized. We define a dummy variable that takes the value of 1 after that reform.

3.-Countries that were closed and democratic at the beginning of the sample period and opened to trade. We define a dummy variable that takes the value of 1 after that reform.

4.-Countries that were open and autocratic at the beginning of the sample period and democratized. We define a dummy variable that takes the value of 1 after that reform.

5.-Countries that were closed and autocratic at the beginning of the sample period and opened to trade first and then democratized. We define a dummy variable that takes the value of 1 after the first reform and another after the second.

6.-Countries that were closed and autocratic at the beginning of the sample period and democratized first and then opened to trade. We define a dummy variable that takes the value of 1 after the first reform and another after the second.

The main predictions of my model are about 1, 3, and 5 and 6. Liberalizing should increase expropriation and inefficiency for an autocratic regime and have no effect for a democracy.

The sample also includes countries that did not go through any of the reforms and those that underwent both before the sample period starts. These countries will be my control group.

When a reform takes place, its results take time to show. For this reason, I only consider permanent reforms: if a country opened to trade for two years, then went back to being closed, the country is considered to be closed for that whole period. For the same reason, I discard reforms that took place after 1998: the effects of a reform in 1998 are not likely to be observed until well after the 2000 cut-off.

The specification to estimate by OLS is

$$y_{it} = \mu_t + \delta_i + \sum_j \alpha_j REFORM_{it,j} + X'_{it}\beta + \varepsilon_{it}, \tag{3.4}$$

where y_{it} is expropriation, μ_t and δ_i are time and country fix effects, $REFORM_{it,j}$ takes the value of 1 after treatment j as defined above, and X_{it} are additional control variables.

The key identifying assumption of the DID approach is that there are no omitted variables that affect performance and move in a different way for the treatment and control groups. This means that both groups should be fairly similar, the only difference between them being whether they were treated or not. Because the control group includes both countries that underwent both reforms prior to the sample period and countries that until today did not undertake any of the reforms, this is likely to be the case. [4]

Also, the treatment should not be endogenous. Whether a country is liberalized to trade or not should not be determined by its degree of inefficiency. This issue is much more relevant and problematic than the first. As discussed in the Introduction, the relationship between political power, economic performance, economic institutions, and political institutions is a non-trivial, dynamic one. Policies that affect the distribution of resources may affect the allocation of power, and with that change political institutions. In other words, expropriation may (or may not) lead to more democratic economies. There is nothing we can do to correct for this in this context; we are aware of it, but must proceed by ignoring it. Also, it is not clear in which direction this could bias our estimations. As discussed in my previous work, the fact that trade exacerbates the inefficiency of policies that minority groups in power use to extract income from other groups makes it harder for transition to democracy to occur. But trade might still benefit some groups, other than the elite, through the standard trade effects, and trade increases the incentives to overthrow inefficient regimes, which goes against the first effect.

Table 3 provides a full description of the treatment and control groups. Table 4 shows the results of regressing expropriation risk on the treatments, and country and years fixed effects. Again, notice that variables capturing governance are defined from poor quality to better quality, a positive coefficient when regressing expropriation risk on trade liberalization means that trade decreased the risk of expropriation.

Let me analyze first the differences between countries that took both reforms in different order. According to the model, countries that liberalized before democratizing should have more expropriation. For democratic countries, there should be no effect on expropriation.

[4] I refer the reader to Tavares (2005) for a discussion on the similarities of both the treatment and the control groups. Tavares' paper uses the same control and treatment groups to analyze the effects in corruption of both treatments. She finds results similar to my results in corruption, although somewhat different due to the fact that she defines a broader set of treatments (she distinguishes between countries that underwent both reforms very close together in time or very far apart).

Notice that in both cases the coefficients are positive and significant. Which one is larger depends on whether we include regional dummies or not. Without them, the coefficient for democratic regimes is larger, and once we include regional dummies the coefficient for non-democratic regimes is the largest one. But they are not significantly different. Thus, the results for this set of countries are not satisfactory.

When we look at countries that only undertook one reform during the sample period, the model predicts that those that liberalized while being non-democratic should have more expropriation, while those that liberalized while being democratic should have no effect. Comparing the coefficient on those that liberalized while being democratic with those that did the same while being non-democratic, the results are on the line of what the model would predict: countries that liberalized to trade while being democratic experienced a larger improvement on protection against expropriation that those that were non-democratic.

Remember that the model predicts a deterioration for non-democratic regimes and no change for democratic countries. The results go on the same direction, no change for non-democratic regimes and an improvement for democratic ones, but are quantitatively different. Given that trade reforms are typically accompanied with other reforms trying to remove distortions (specially if the trade reform is promoted by the IMF), I take these results as suggestive that the forces at play in Segura-Cayuela (2006) are present in the data. Although far from satisfactory and conclusive, the evidence in this section provides some insights on the mechanism described by the model, especially for countries that undertook only one reform.

3.6 Conclusions

I began by describing how less-developed economies with dictatorial regimes have experienced poor economic performance over the last 40 years despite being much more integrated to the global economy. In this paper I provide evidence of the explanation suggested in Segura-Cayuela (2006): increased trade may lead to worse policies and economic institutions in societies with weak political institutions. In a closed economy, groups with political power are restrained in their rent extraction policies because of the general equilibrium price effects that these will create. Increased international trade removes these price effects and may increase the intensity

of rent extraction, and with that increase inefficiency.

In particular, using a panel of 92 countries and 17 years (1994 to 2000) I showed using an Ordinary Least Squares with fixed effects approach that non democratic countries that trade more have worse protection against expropriation, while democratic regimes that trade more experience and improvement on protection against expropriation. On the other hand, the Difference-in-Difference approach showed mixed evidence.

These results are on the lines of what the theoretical model predicts, but are far from satisfactory. I discussed in the empirical section the limitations on the data available. Measures of governance and expropriation are subjective, reflecting outcomes and not incentives and varying little year-by-year. Also, the treatment variables used on the DID approach are built against the result we want to find, probably being responsible for the mixed evidence found using the Difference-in-Difference approach. The lesson from this is that, to further address the validity of the relevant forces in this model, more work needs to be done.

A possibility would be to perform individual country studies for dictatorial regimes, trying to tie economic sectors to the influence they have in the government. If we could identify the economic allies of a dictatorial regime, we could repeat exercises similar to those in the standard empirical trade literature, adding controls for sectors with connections to the elite. The question to be asked is whether the growth in the production and exports of a sector, controlling by comparative advantage, can be explained by the connections with the regime of those sectors. I am currently working on an exercise of this type in the context of the Franco regime in Spain and the Stabilization Plan promoted by the IMF during the 1960's.

A more indirect test of the forces at play in this paper would be to include non-tradable goods. A model like these would potentially predict that, because non-tradables have to be bought at home, expropriation in this sector should be smaller. If this is the case we should observe that, when an economy with weak political institutions opens to trade, employment shifts from tradable to non-tradable sectors to avoid expropriation.

Finally, given the non-monotonic predictions from the theory, it would be interesting to perform an structural test of the model in Segura-Cayuela (2006).

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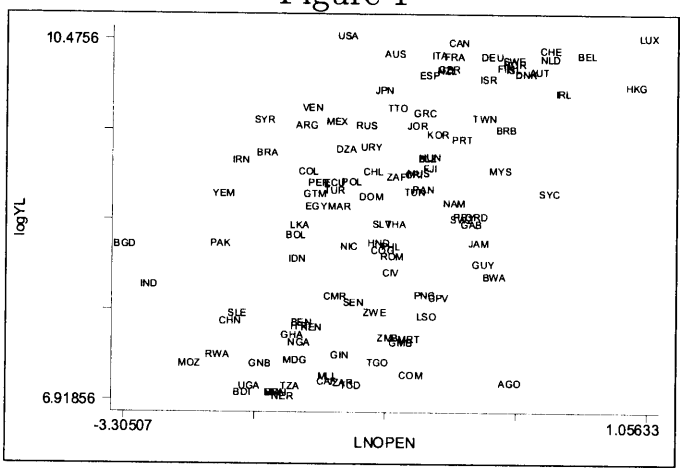
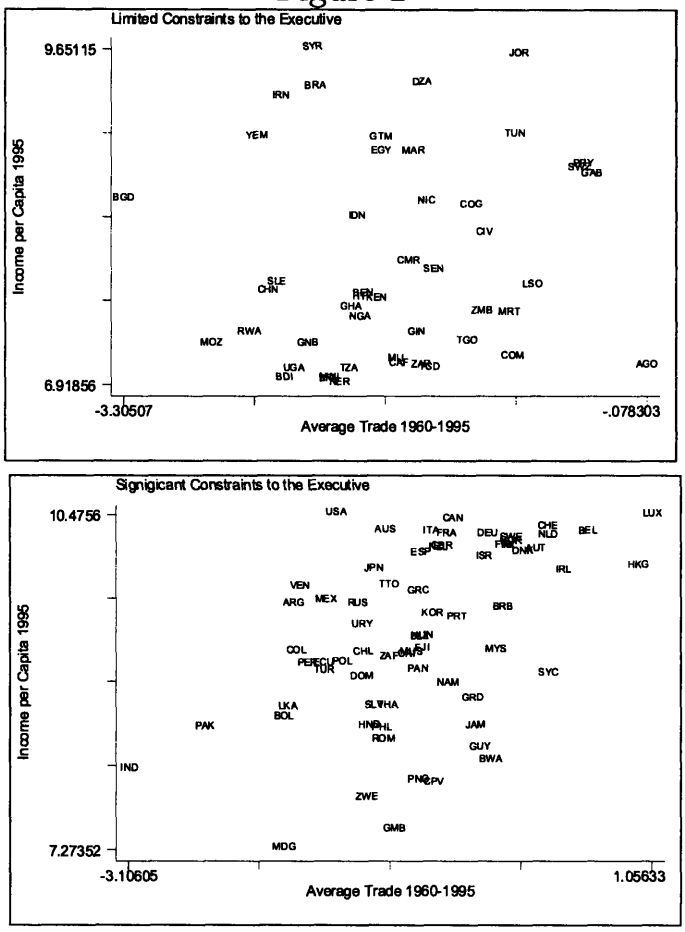
3.7 Appendix A: Figures

Figure 1



Source: Penn World Table Version 6.1

Figure 2



Sources: Penn World Table Version 6.1 and Polity IV data set

3.8 Appendix B: Tables

Table 1--Effects of trade and democracy on expropriation

	(1)	(2)	(3)
	expropriation risk	expropriation risk	expropriation risk
lag of expropriation risk	0.841	0.838	0.702
	(0.017)***	(0.018)***	(0.038)***
democracy level	0.050	0.049	0.155
	(0.013)***	(0.012)***	(0.040)***
openess	-0.017	-0.071	-0.308
	(0.037)	(0.049)	(0.135)**
interaction openess and democracy level	-0.043	-0.066	-0.107
	(0.020)**	(0.021)***	(0.060)*
interaction openess and democracy dummy		0.073	0.210
		(0.033)**	(0.094)**
Hansen J Test			0.971
AR(2) Test			0.294
Countries	92	92	92
Observations	1303	1303	1214
Adjusted R-squared	0.92	0.93	

* significant at 10%; ** significant at 5%; *** significant at 1%

Sample is an umbalanced panel with 92 countries and annual data from 1983 to 2000. Controls include country and year fix effects. Fixed effects OLS regressions in columns 1 to 8, with robust standard errors clustered by country in parentheses. Column 3 uses Arellano and Bond (1981) with robust standard errors in parentheses.

Table 2--Effects of trade and democracy on expropriation

	(1)	(2)	(3)	(4)	(5)	(6)
	expropriation risk	expropriation risk	expropriation risk	expropriation risk	expropriation risk	expropriation risk
lag of expropriation risk	0.840	0.836	0.827	0.828	0.816	0.826
	(0.019)***	(0.018)***	(0.019)***	(0.020)***	(0.021)***	(0.021)***
democracy level	0.053	0.050	0.048	0.045	0.044	0.049
	(0.014)***	(0.012)***	(0.013)***	(0.013)***	(0.013)***	(0.014)***
openess	-0.110	-0.067	-0.078	-0.080	-0.087	-0.104
	(0.052)	(0.050)	(0.049)	(0.053)	(0.054)	(0.063)
interaction openess and democracy level	-0.081	-0.072	-0.058	-0.073	-0.074	-0.092
	(0.029)***	(0.022)***	(0.021)***	(0.023)***	(0.023)***	(0.033)***
interaction openess and democracy dummy	0.088	0.080	0.071	0.095	0.095	0.104
	(0.038)**	(0.035)**	(0.035)**	(0.038)**	(0.036)***	(0.046)**
human capital	0.259					0.223
	(0.124)**					(0.124)*
GDP per worker		-0.041				-0.050
		(0.045)				(0.053)*
Investment			0.047			0.042
			(0.019)**			(0.020)**
Population				0.179		0.195
				(0.090)**		(0.110)*
Labor Force					0.293	
					(0.082)***	
Countries	92	92	92	92	92	92
Observations	1158	1257	1256	1288	1288	1114
Adjusted R-squared	0.94	0.93	0.93	0.93	0.93	0.94

* significant at 10%; ** significant at 5%; *** significant at 1%

Sample is an umbalanced panel with 92 countries and annual data from 1983 to 2000. Controls include country and year fix effects. Fixed effects OLS regressions in columns 1 to 8, with robust standard errors clustered by country in parentheses.

Table 3--Treatment and Control Groups

A--Control: Countries Always Open and Democratic or Never Open nor Democratic

Algeria	Estonia	Latvia	Singapore
Angola	Finland	Liberia	Slovak Republic
Armenia	France	Lithuania	Slovenia
Australia	Gabon	Malaysia	Somalia
Austria	Gambia	Moldova	Spain
Azerbaijan	Germany	Morocco	Sweden
Belarus	Greece	Myanmar	Switzerland
Belgium	Haiti	Netherlands	Syria
Botswana	India	Nigeria	Togo
Canada	Indonesia	Norway	Ukraine
China	Iraq	Papua New Guinea	United Kingdom
Congo D.R.	Ireland	Paraguay	United States
Croatia	Italy	Portugal	Yemen
Cyprus	Japan	Russia	Zimbabwe
Czech Republic	Jordan	Senegal	
Denmark	Kazahstan	Sierra Leone	

B--Treatment: Autocratic Countries that Opened to Trade

Country	Year
Cameroon	1993
Egypt	1995
Guinea	1986
Ivory Coast	1994
Kenya	1993
Tanzania	1989
Tunisia	1995
Uganda	1988

C--Treatment: Democratic Countries that Opened to Trade

Country	Year
Argentina	1991
Bolivia	1985
Colombia	1986
Costa Rica	1986
Dominican Republi	1992
Ecuador	1991
El Salvador	1989
Honduras	1991
Israel	1985
Jamaica	1989
New Zealand	1986
South Africa	1991
Sri Lanka	1991
Trinidad & Tobago	1992
Turkey	1989
Venezuela	1996

D--Treatment: Closed Countries that Democratized

Country	Year
Iran	1997
Malawi	1994
Pakistan	1998

E--Treatment: Open Countries that Democratized

Country	Year
Chile	1989
Korea	1987
Thailand	1984
Taiwan	1992

F--Treatment: Countries that Liberalized First and Democratized After

Country	1st Treatment	2nd Treatment
Ghana	1985	1996
Guinea-Bissau	1987	1991
Guyana	1988	1992
Mexico	1986	1994
Mali	1988	1992
Peru	1991	1993

F--Treatment Group: Countries that Democratized First and Liberalized After

Country	1st Treatment	2nd Treatment
Albania	1990	1992
Bangladesh	1991	1996
Bulgaria	1990	1991
Brazil	1985	1991
Ethiopia	1993	1996
Guatemala	1986	1988
Hungary	1989	1990
Madagascar	1991	1996
Mozambique	1994	1995
Niger	1991	1994
Nicaragua	1990	1991
Panama	1989	1996
Philippines	1986	1988
Poland	1989	1990
Romania	1990	1992
Uruguay	1985	1990
Zambia	1991	1993

Table 4--Effects of trade liberalization and democratization on Expropriation

	(1)	(2)
	expropriation risk	expropriation risk
Effect of democratization before liberalizatior	0.024	0.123
	(0.028)	(0.030)***
Effect of liberalization before democratizatior	0.139	0.202
	(0.053)**	(0.052)***
Effect of democratization after liberalization	0.015	0.168
	(0.060)	(0.059)***
Effect of liberalization after democratization	0.102	0.212
	(0.020)***	(0.018)***
Effect of democratization for open economies	0.036	0.194
	(0.065)	(0.054)***
Effect of democratization for closed economi	0.065	0.234
	(0.050)	(0.041)***
Effect of liberalization for democracies	0.108	0.270
	(0.031)***	(0.029)***
Effect of liberalization for dictatorships	0.017	0.191
	(0.049)	(0.050)***
Observations	1421	1421
Adjusted R-squared	0.82	0.68

* significant at 10%; ** significant at 5%; *** significant at 1%

Sample is an umbalanced panel with 92 countries and annual data from 1983 to 2000. Controls include country and year fix effects on both Columns, and the interaction of year with regional variables on Column 2 . Fixed effects OLS regressions in columns 1 and 2, with robust standard errors clustered by country in parentheses. Controls include country and year fix effects.