Why the US and not Brazil?
Old Elites and the Development of a Modern Economy

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Abstract
Old elites can block changes, but not all do. Why is it that stronger elites may allow more changes than weaker elites? Why do economies with larger stocks of natural resources do not grow faster than economies poorer in natural resources?

We argue that old elites hold some power to extract rents from the economy. Whereas old sectors (i.e. agriculture or extraction of natural resources) are not affected by rent extraction, modern sectors require investments that do react to rent extraction. At the same time, a modern sector relies on networks of firms. These structures form the basis of political power of a new elite, which reduces the ability of the old elite to extract rents.

We show that a country’s rich in natural resources provides its old elite with incentives to extract rents so high that a private sector has no incentives to build up a modern economy. If the old elite is either politically very strong or the natural resource sector is small compared to the potential of the modern sector, the old elite will choose to extract smaller rents from a growing sector. Some empirical evidence completes the paper.

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1. Introduction

Some elites tax a modern sector into oblivion, such as 19th century Austria, Uzbekistan and Ethiopia in the 1990’s, and Zimbabwe in the last few years. Other elites back reforms that reduce taxes on modern sectors, such as 19th century England, Poland in the 1990’s and Kazakhstan just last year. Why this divergence?

The general answer on which economists, political scientists, and sociologists agree is that some elites fear a loss of power coupled with the impossibility of a modern sector to buy out an old elite with future tax revenues.¹ On this impossibility of a buyout, Acemoglu (2002) remarks that ‘there is no outside agency with the coercive capacity to enforce such arrangements’. Even if such an agency were to exist though, it would still be extremely difficult to bind future firms and future generations to previously agreed upon transfers.

On the question of what it is about a modern sector that makes old elites fear them, opinions diverge. One explanation has been that old elites fear the technology of a modern sector. One version, termed the ‘economic-losers hypothesis’ by Acemoglu and Robinson (2000a), is that incumbents prevent the adoption of new technology by others to prevent erosion of their sunk technological capital. Such ‘machine-rage’ is however seldom successful and thereby of scant empirical relevance. The historical attempts of old technology holders to prevent the adoption of new technologies such as book-printing, guns, mechanized transport, IV, mechanized sewing-machines, and the internet have been spectacularly unsuccessful.

Another version is that technological growth is the driving force behind the growing relative economic might of industrialists which in turn leads old elites to block technological growth as a means of preserving power. The key relevant assumptions employed by Acemoglu and Robinson (2000, 2002) are that the modern sector grows exclusively via technology and that its growth increases the odds that an old elite loses power.

This hypothesis too is implausible though: even the most dictatorial regime is nowadays ‘on-line’ and employs the latest technology to extract rents and subdue opposition. Technology benefits ‘old-sectors’ sometimes even more than the new sectors. For instance, even in dirt-poor areas devastated by rent-seeking inspired wars, such as the Congo at present, mineral extraction uses the best technology available. It is much hence more the case that the modern sector in many developing countries is kept very small due to rent-extraction rather than that technology per se is resisted. Indeed, the history of ‘white-elephants’ in Africa, i.e. technological prestige projects that never made productive sense, suggests that dictatorial regimes are often keen to embrace modern technology themselves.

The assumption that political power is discrete, i.e. all or nothing, is also problematic. The loss of power of the old elite is seldom discrete but continuous. It may be pointed out that even today there is a British, German, and Austrian aristocracy that enjoys considerable rents. Neither is the aristocracy the only remnant of ‘old power’. The Church of England for instance still owns about 40% of the agricultural land in the UK and churches in Germany are still financed via the federal tax system, more than a century after the key reforms that allowed industrialization to take place.

We argue that it is not technology that is feared by the old elite, but rather the rise of networks of business relations that typify modern sector growth. The economic benefit of these networks is to allow specialization to be perfected. These networks and the institutions that result from the investment in such networks also form an alternative political network that is an opposing power to that of the old elite. In our model the power of the new politicians connected to the modern sector network sets an upper limit on the possible extraction of rents by the old elite. Individual firms are small enough not to benefit individually from this political effect. Hence, when the old elite allows the modern sector to grow it has to weight its loss of political power against the growing productivity of the economy. The old elite will be able to extract a smaller share from a growing pie. Crucial in determining what happens is then not only the initial strength of the old elite, but also the size of the pie in the absence of any modern sector, i.e. the
size of the traditional or natural resources exploitation sector. The higher this ‘fixed-pie’, the more an old elite has to lose by a growing modern sector and hence the higher the disincentives provided by the old elite for the modern sector.

Our model explains why in some cases where countries break up, the smaller resource-rich parts actually increase taxes on the modern sector, for instance Uzbekistan after the break up of the USSR. This could not have arisen in models where the old elite in the previously existing country has already ‘lost entirely’ to a modern sector. Our model furthermore makes it possible to define what the ‘feared’ modern sector is and what the old sector is: the modern sector is any sector that needs new and large networks to flourish. Sectors that flourish without networks are not a threat and are thus expected to be a welcome source of rent extraction for any old elite. This fits the observation that technologically advanced mineral extraction companies are welcomed in many dictatorships whilst modern service industries are not.

The differing fortunes of the US and Brazil are particularly instructive. The secession of the US from the UK was a tax revolt heavily dependent on networks of bankers and small industry. To a large extent this revolt was a surprise to the colonial powers, probably alerting elites for the first time to the power of modern networks. Brazil, as described by Gunter Frank (1967), contained the New World’s first iron works, exported textiles and was then rich in coffee, gold, sugar, and diamonds. Its population was close to that of the US. In the 1780’s Brazil was experiencing a boom in small-scale industry very reminiscent of the US. With the example of the US in mind, the colonial ruler of Brazil (i.e. Portugal) decreed:

‘I, the Queen,...., knowing of the large number of factories and manufactures which, in recent years, have spread through the various capitanias of Brazil, ...., I deem it well to order that all the factories, manufactures or shops of ships...shall be extinguished’ (page 161)

This decree, enforced with the help of the natural resource sector, nipped the modern Brazilian sector in the bud. By the time the Portuguese royal court fled Napoleon’s armies in 1808, Brazil no longer had a serious manufacturing base to
help any war effort. Without this exogenous shock to the power of the modern sector at a crucial time, Brazil might well have been the world’s foremost industrial power today.

In the next Section we discuss the literature, after which we present our model and results. The final Section concludes.

2. Literature

Anne O. Krueger (1993) dedicated her Ohlin Lectures to reforms in developing countries. She discussed various forces that determine how politicians deal with “Market reactions to politicians’ decisions [that] influence both individual politicians and their further decisions and also change the nature of the political balance among competing political groups”.

Acemoglu and Robinson (2000, 2002) and Acemoglu (2003) provide specific models on this question. In Acemoglu and Robinson (2002) an incumbent government has to decide whether to allow a growth enhancing reform or not. Introducing the reform will change the distribution of power in the economy and the costs to replace a government. The government will be replaced if the public expect more benefits from a new government than it suffers from the costs of financing the change in government. The authors show that the old elite may block reforms because technological and institutional reforms will increase the probability that the incumbent loses his position.

Krusell and Rios-Rull (1996) argue that vested interests of some agents prevent the adoption of a new technology. In their model these agents are market incumbents, hence old firms who want to block competition by new, modern firms with a better technology.

Acemoglu and Robinson in another set of papers (2000b, 2000c, 2001) address the question of democratization and redistribution in a two (three) class society. (Full) Democratization will lead to the poorest class determining redistribution. These articles contain two arguments. First they argue that democratization can be seen as a policy to appease the lower class by guaranteeing redistribution not
only in the current period with a strong lower class (2000b,c) but also in the future, thus avoiding social unrest and larger demands (socialization of private property). Partial democratization, namely shifting power to a middle class, maybe dominated because it is a sign of weakness of the old elite (2000b) even though it would mean less redistribution and thus less contributions that have to be made by the old elite. Second, they study the stability of a political system, namely, they allow the poor to start a revolution and the rich to stage a coup (2001). A system is consolidated if the costs of a revolution to the poor or the costs of a coup to rich are too large. The ruling class will use redistribution policies to avoid a system change if possible. Redistribution is affected by measures of democratic freedom - the costs of staging a coup and starting a revolution. A very democratic and equal society (coups are expensive, revolutions cheap) has the highest rates of redistribution. A very undemocratic system (coups are cheap and revolutions expensive) has lowest rates of redistribution. In the in between case were a coup is not too expensive we may observe less redistribution because the poor class avoids too high redistribution to consolidate the system. In the case that both costs are large but not too large, Acemoglu and Robinson observe that the system will continuously switch between the two systems. One aspect of this theory of political transition is that higher inequality in a society always implies a higher volatility of fiscal (redistributive) expenditure and may in some cases change the status of the system. One especially interesting case is that the inequality may increase to a certain level where the poor can only keep democracy by refraining from too much redistribution to appease the rich and thus avoid a coup. Under this constellation higher inequality leads to lower redistribution.

Parente and Prescott (1994, 1999, 2000) show empirically that barriers to technological reforms affect economic growth. In the 2000 Walras Lecture they explicitly argue a certain form of rent extraction, namely that the government (the king) extracts rents by granting monopoly rights to certain producers and that these leads to less competition and an inefficient use of available technology and hence hampers the growth potential of an economy. Countries differ in how much governments made use of this instrument to generate income.
Hahn (2003) argues that an old elite is not observed by others, but nevertheless has the power of sabotage, i.e. it can stop any reform. An old elite will then stop any reform as long as there is any rent remaining in the present situation. Because reformers cannot commit to future transfers to the (unobserved) old elite, reforms will then only take place after all rents are exhausted.

3. A Model of Political Power, Rent Extraction and a Modern Sector

The economy consists of two sectors. The old sector is completely independent of contacts. We think here mainly about the extraction and sale of natural resources to the world market. This including cash-crop agriculture, which can be understood as the sale of exploitation of the fixed resource land. The modern sector needs a network of business relation (relational capital\(^2\)) to function and prosper. The essential role of these networks is to allow firms and individuals to specialize on their comparative advantage and to outsource all other activities. In the old sector we assume that the income generated is fixed at \(\bar{y}\).

Sector 1, the modern sector, is populated by an infinite number of firms with mass 1. The output of a representative firm is \(f(RC_t) = RC_t^\alpha\) where \(RC_t\) is the size of the network of contacts of an individual firm at time \(t\). This production function is kept simple for presentational purposes, but we will discuss the necessary assumptions on a general production function later\(^3\). By assumption firms face diminishing returns to scale, i.e. \(0 < \alpha < 1\). We assume that even though we denote only the relational capital as an input that firms also increase other inputs at the same rate (hence inputs are complete complements). \(RC\) is productive for one period only but it determines the political power of the modern sector in the next period. \(RC\) can be generated (or maintained) at marginal cost \(c\). One can

\(^2\)Bezemer et al. (2003) and Frijters et al. (2003) work with a concept of relational capital that suits particularly well our understanding of the importance of contacts for the working of an economy.

\(^3\)Another simple example which yields the same result is \(f(RC_t) = \ln RC_t\).
see this as the labor costs of building a network with a fixed wage rate (constant outside option).

The political sector contains two types of politicians. The first type decides purely in the interest of the old elite. These could include representatives of traditional farming, or could simply be powers-that-be such as existing monarchs and existing political elites. Of the second type are representatives of the modern sector. We take the political network of the first group to be fixed and equal to $PP_0$ which hence indicates the power contained by the political network of existing non-modern sector elites. We refer to this group as the ‘old elite’. The political network of the second group is directly proportional to the size of the networks of the modern sector, i.e. equals $PP_m = M_0 + RC_{t-1}$. This points to the dual role of relational capital, i.e. its direct productive role in securing sold output and its role as a network leading to political power. $M_0$ represents a basic political power the modern sector might have at the beginning of the process.

Politicians decide on the rent extraction rate from the economy by setting an additional tax. As far as they decide on taxes funding public goods beneficial for all, incentives of all politicians will overlap and there will be no disagreements. We hence leave them out of consideration and focus on taxes that have no direct benefit. There is only one tax in our framework, namely a tax on produced output. Tax receipts are by definition divided over the old elite (we take taxes to be net of flows to the holders of RC). Now, in each period, the current set of politicians bargain over taxes. For the politicians of the modern sector, it is the case that their preferred tax rate is going to be $\tau_t = 0$ in all periods, simply because these taxes are distortionary and the revenue that is raised by them has to be shared with individuals not from within that sector. The full weight of the ‘new elite’ will hence be towards $\tau_t = 0$. On the other hand, the ‘old elite’ will always want positive taxes on the modern sector. As their maximum position, they could wish $\tau_t = 1$. In line with our additive notion of power, the weight of the old elite in political decision making is $\frac{PP_0}{PP_0 + M_0 + RC_{t-1}}$.\(^4\) If they bargain over positions, the result is

\(^4\)Although we have in mind a notion of power in which elected politicians are only one source of decision making, there are micro-stories under which our abstraction arises endogenously.
that the ‘old elite’ at each moment in time can choose a tax rate $\tau_t$ smaller than the maximum tax rate $\tau_t = \frac{PP_0}{PP_0 + M_0 + RC_{t-1}}$ it can push through given the political constellation. A feasible outcome of this economy is thus any set $\{\tau_0, \ldots, \tau_T\}$ of which each $\tau_t$ lies in the region $\left[0, \frac{PP_0}{PP_0 + M_0 + RC_{t-1}}\right]$ where $RC_{t-1}$ is endogenous.

A note on the interpretation of this political game. One way of looking at it, is to say that there are infinitely many small regions in this country, completely controlled by either one or the other side, depending on the affiliation of the politician in that part. The local politician then sets the taxes and divides them amongst his or her supporters. The model above can be seen as describing such a region-based political game in the situation that regions themselves continuously change hands according to probabilities defined by the shares of parties in the total political network. Another interpretation of our political model is one in which centralized power itself is made up of many small units (see them as ‘parts of the administration’) that can be controlled by different groups. If each small

We want to briefly mention two of them. Both include interpretations $PP_0$ as the number of politicians of the old elite and $M_0 + RC_{t-1}$ as the number of the new elite. (An equivalent interpretation is to view them not as numbers of politicians but as some aggregate support such as campaign funds or the number of voters that can be suaded). Suppose that there are a large number of regions with weight one and that the side with the most politicians in a region wins the local elections and controls the decisions of that region. Suppose that firms are equally spread out over all regions so that the maximum amount of tax an old elite could extract from each firm equals the proportion of regions they control (or, equivalently, they decide ex ante on where to locate production each period and use expected taxes as their guide). The old and the new elite have to simultaneously divide their politicians over regions.

In the first story, the elections are sequential and the politicians who win in one region are ‘absorbed’ by that region (they have to fulfill public functions). The losing politicians can be moved on to other regions. The only equilibrium is then that each party allocates a political weight of $\frac{PP_0}{PP_0 + M_0 + RC_{t-1}}$ to each election in each region. The amount controlled then equals $\frac{PP_0}{PP_0 + M_0 + RC_{t-1}}$ for the old elite and $\left(1 - \frac{PP_0}{PP_0 + M_0 + RC_{t-1}}\right)$ for the new elite.

In the second story, there is an unknown pivotal issue that voters care about in each region. The issues may differ in each region. The first politician to ‘hit’ that issue wins the election. When the number of issues hit by politicians is linear in the number of politicians in a region, then again the optimal political weight assigned to each region is $\frac{PP_0}{PP_0 + M_0 + RC_{t-1}}$ and the proportions of regions ending up in the control of the two camps is as in the first story.
unit has to ‘chip in’ towards an effective policy and divides the revenues it obtains over its political backers, we again get the situation described above.

Our political set-up is a long cry from most political economy models that assume that power ultimately is equally divided over individuals via the one-man-one-vote assumption. For developing countries such a one-man-one-vote assumption is very problematic. Even in countries that are notionally democratic, elected politicians are not the only ones that make decisions. Demands from the military, industry, agricultural lobbies, unions, lower-level bureaucracies, etc., can often not be ignored by elected politicians. Very often, interest groups directly control certain (semi-) state organs and hence by-pass nationally elected politicians completely. Rather than adopting the one-man-one-vote assumption in a set-up where a single unit decides all (i.e. a national administration), we take the dynamics of power in the whole economy as the central problem. It is then much more natural to conceive of power as a continuous concept.

The timing is the following. There is an infinite number of discrete periods. At period 0 the modern sector is non existent, i.e., \( RC_0 = 0 \). We start with period 1. Each period consists of two stages. First the old elite chooses a \( \tau_t \leq \bar{\tau}_t \) as described above. Then firms choose independently from each other a \( RC_t(\tau) \) and produce \( y(RC_t) \). Taxes are paid and the rest is consumed. Each individual in this economy uses exponential discounting at rate \( \rho \). The per-period pay-off of each individual entrepreneur in the modern sector period is now

\[
(1 - \tau_t)f(RC_t) - c(RC_{t-1}).
\]

The old elite’s payoffs equal

\[
\tau_t \left( f(RC_t) + \bar{y} \right).
\]

The trade-off that the old elite faces is simple: if it decides to tax the modern sector by a large amount, the modern sector will not develop and there will be less to tax. If it does not tax the modern sector heavily, the modern sector will grow fast yielding more tax revenues, but it will mean that the tax revenue from the mineral sector is lower. Intuitively, if \( \bar{y} \) is very high (or \( f(.) \) not very high), we
would expect the ‘old elite’ to be relatively little interested in allowing a modern sector to grow and we should see punitive taxes on the modern sector.

4. Choices and Constraints of the Old Elite

In each period firms choose $RC_t$ without taking into account the externality of their behavior on $\tau_{t+1}$. The optimal level of $RC_t$ of the individual firm and thereby of the whole economy then equals

$$RC^*(\tau) = \left(\frac{\alpha(1-\tau)}{c}\right)^{1/(1-\alpha)}$$

Given this reaction function, the old elite can predict not only the investments of the new sector but also its relative political power at the end of the period. Consider the steady state of the model. In the steady state, the old elite will maximize its period payoff under the political restriction:

$$\max \tau \left( \overline{\gamma} + f(RC(\tau)) \right) \text{ s.t. } \tau \leq \tau_t = \frac{PP_0}{PP_0 + M_0 + RC(\tau)}.$$

This maximization problem has three candidates for a solution. To state the result we need the following lemma.

**Lemma 1.** $\tau_t(RC(\tau))$ has at least one and at most three intersections with $\tau$.

**Proof.** At least one intersection exists because $\tau_t(RC(\tau))$ is continuous in $\tau$ and $\tau_t(RC(\tau = 0)) > 0$ and $\tau_t(RC(\tau = 1)) < 1$. At most three intersections exist when $\tau_t(RC(\tau))$ has at most one inflection point for $0 < \tau < 1$. This is the case when $\frac{d^2\tau_t(RC(\tau))}{d\tau^2} = 0$ has either no or one solution. The necessary condition is equivalent to $\frac{(2-\alpha)RC(\tau=0)}{(PP_0 + M_0)^\alpha} = \frac{1}{(1-\tau)^{1/(1-\alpha)}}$. The left hand side of this equation is a positive constant whereas the right hand side is a strictly increasing function in $\tau$. Hence there is either one or no solution.

Because of continuity, the generic outcome is having either 1 or 3 such ‘fixed points’\(^5\). If there are three such ‘fixed points’, we refer to: $\tau^{\text{min}} = \min \{ \tau \mid \frac{PP_0}{PP_0 + M_0 + RC(\tau)} \}$.\

\(^5\)This means that if we would see $M$ and/or $PP_0$ as drawn from a continuous probability distribution, having precisely 2 outcomes has zero probability of occurrence.
\[ \tau^{\text{max}} = \max\{\tau \mid \tau = \frac{PP_0}{PP_0 + M_0 + RC(\tau)} \} \] and \( \tau' \) as the potential third point fulfilling \( \tau = \frac{PP_0}{PP_0 + M_0 + RC(\tau)} \). \( \tau^{\text{min}} \) represents a lower limit of a tax rate that the old elite can always push through, given that \( RC \) is limited from above by the assumptions on the technology. \( \tau^{\text{max}} \) is the maximum tax rate the old elite can push through given the guaranteed power \( M_0 \) of the modern sector. If there is only one fixed point we denote it by \( \tau^{\text{min}} \) if \( \tau_t(RC(\tau)) \) is convex at this point and as \( \tau^{\text{max}} \) if \( \tau_t(RC(\tau)) \) is concave.

To state our result, we denote by \( \tau^{\text{old}} = \arg \max \tau(\bar{y} + f(RC(\tau))) \), i.e. the tax rate the old elite would choose in the absence of modern sector politicians. Figure 4.1 provides an example with three intersections. \( \tau^{\text{old}} \) is in this example between \( \tau^{\text{min}} \) and \( \tau_0 \) at the maximum of the profits curve. Figure 4.2 provides two examples for the case of only one intersection. In case 1, we refer to the intersection as \( \tau^{\text{max}}_1 \), in case 2 as \( \tau^{\text{min}}_1 \). The following proposition states the result.

**Proposition 1. (Steady State Extraction Rates)**

If \( \tau_t(RC(\tau)) \) has only one fixed-point \( \tau^{\text{fp}} \) then the steady state rent extraction rate of the economy is given as \( \tau^* = \min\{\tau^{\text{fp}}, \tau^{\text{old}}\} \).

If \( \tau_t(RC(\tau)) \) has three fixed points \( \{\tau^{\text{min}}, \tau', \tau^{\text{max}}\} \) then

\[
\tau^* = \begin{cases} 
\tau^{\text{old}} & \text{if } \tau^{\text{old}} \leq \tau^{\text{min}} \\
\tau^{\text{min}} & \text{if } \tau^{\text{min}} < \tau^{\text{old}} < \tau' \text{ and } \tau'(\bar{y} + f(RC(\tau'))) \leq \tau^{\text{min}}(\bar{y} + f(RC(\tau^{\text{min}}))) \\
\tau' & \text{if } \tau^{\text{min}} < \tau^{\text{old}} < \tau' \text{ and } \tau'(\bar{y} + f(RC(\tau'))) > \tau^{\text{min}}(\bar{y} + f(RC(\tau^{\text{min}}))) \\
\tau^{\text{old}} & \text{if } \tau' < \tau^{\text{old}} < \tau^{\text{max}} \\
\tau^{\text{max}} & \text{if } \tau^{\text{old}} \geq \tau^{\text{max}}. 
\end{cases}
\]

**Proof.** Having established the characteristics of \( \tau_t(RC(\tau)) \) we refer to figure 4.1 to make our argument. The old elite in the steady state choose any \( \tau \) that fulfills two conditions, namely: \( \tau_t \leq \tau_t(RC(\tau_{t-1})) \) and \( \tau_t(RC(\tau_{t-1})) = \tau_{t+1}(RC(\tau_t)) \). Hence, the set the old elite can choose from are all points where \( \tau_t(RC(\tau)) > \tau \).

For the case of one fixed-point, this implies that either the old elite can choose - depending on the parameters - from the set \([0; \tau^{\text{max}}]\) or from the set \([0; \tau^{\text{min}}]\). The latter poses a stricter constraint. The size of the sector is determined by the solution to the constrained optimization problem.
For the case of three fixed points, the set to choose from is given by $[0, \tau_{\text{min}}] \cup [\tau'; \tau_{\text{max}}]$ and the solution again solves the constrained maximization problem. These are the values stated in the proposition.

The following figures illustrates the possibilities. We start with the three fixed point case (figure 4.1). In equilibrium, the old elite has to choose a point on the dotted line where it lies below the (thick) line representing $\tau_t(RC(\tau))$. Why? Because otherwise next period’s tax rate due to the political power constraint is restricted to be lower than the rate chosen in this period. Hence, in this example the old elite can choose from the area between 0 and $\tau_{\text{min}}$ and $\tau'$ and $\tau_{\text{max}}$. The plotted profit curve for the example reveals that the optimal choice is in this case to choose $\tau'$. Now, consider case 1 of figure 4.2. In this case the additional power the modern sector can gain is restricted and the old elite has a bigger discretion to choose from. The $\tau$ maximizing the old elite’s profits is $\tau_{\text{old}}$ which is in this example among the feasible set of tax rates and therefore this point is chosen. Note, the case with a more powerful old elite allows a larger modern sector than the more constrained elite of figure 4.1. In case 2, the modern sector is at the beginning already very strong, hence the set to choose from is very small. This is the case were the modern sector will grow most.

What now happens if the old sector is more important, i.e. if $\overline{y}$ would be higher? This will shift the profit curve up and $\tau_{\text{old}}$ to the right. Given that the political constraint is not affected, the equilibrium size of the modern sector will either be unchanged (the same corner solution as before) or it decreases because of an increase in the equilibrium extraction rate.

These casual observations on the determinants of the size of the modern sector are now stated more formally.

**Proposition 2.** A smaller size of the old sector ($\overline{y}$) never leads to a smaller modern sector.

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6The present figure is a plot for the following parameter values: $\alpha = 0.6, c = 0.25, PP_o = 1, M = 0.04, \overline{y} = 0.25$

7Case 1 is the same as above only $c = 0.4$ is larger. Case 2 is the same example as above but $M = 0.5$ is larger.
Figure 4.1: Profits and politically feasible extraction rates\textsuperscript{6}. 

\[ \tau(\sigma^\alpha \tau) \]

\[ \tau(Y + RC(\sigma^\alpha)) \]

extracted rents:
Figure 4.2: Alternative cases: A weak old elite and weak new politicians.
**Proof.** Denote the two economies to be compared by \( \bar{y}_A \) and \( \bar{y}_B \), with \( \bar{y}_B > \bar{y}_A \). The political constraints are unaffected by the change in \( \bar{y} \). The difference in equilibrium pay-off for the old elite between any tax level in economy \( A \) and the same tax level in economy \( B \) is then \( \tau (\bar{y}_B - \bar{y}_A) \). This means that higher levels of \( \tau \) have strictly higher relative pay-off in \( B \) compared to \( A \). It can hence never be the case that the preferred outcome in \( A \) has a higher \( \tau \) than in \( B \) because otherwise \( \tau_B \) would have been a strictly inferior choice. ■

This ‘resource fallacy’ arises from the fact that a larger old economy on the one hand reduces the relative importance of the potential income from the new sector and on the other hand increases the costs of a stronger modern sector because the stronger modern sector may reduce the old sector extraction rate.

With respect to the importance of the relative initial power of the old elite, we find a non-monotonicity:

**Proposition 3.** Denote the initial situation as \( A \) and the new situation arising from a marginal increase in \( M_0 \) as \( B \). \( \frac{dRC(\tau)}{dM_0} = 0 \) iff \( \tau_A = \tau^{old} \). Otherwise, in the generic case \( \frac{dRC(\tau)}{dM_0} > 0 \) iff \( \tau_A \in \{\tau_A^{min}, \tau_A^{max}\} \) and \( \frac{dRC(\tau)}{dM_0} < 0 \) iff \( \tau_A = \tau'_A \). The sign of \( \frac{dRC(\tau)}{dP_0} \) is the opposite of the sign of \( \frac{dRC(\tau)}{dM_0} \).

**Proof.** The only cases where \( \frac{dRC(\tau)}{dM_0} \neq 0 \) is if \( \tau_A \neq \tau^{old} \). There holds in any case that \( \frac{d\tau}{dM_0}^{min} < 0 \) and \( \frac{d\tau}{dM_0}^{max} < 0 \) whereas \( \frac{d\tau}{dM_0}^{'} > 0 \). When \( \tau_A \in \{\tau_A^{min}, \tau_A^{max}\} \), then in the generic case that point remains optimal (generically, the old elite strictly prefers one of the two which does not change with a marginal change in \( M_0 \)) and hence \( \frac{dRC(\tau)}{dM_0} > 0 \). Generally hence, \( \frac{dRC(\tau)}{dM_0} < 0 \) iff \( \tau_A = \tau'_A \). The statement on the relation between \( \frac{dRC(\tau)}{dP_0} \) and \( \frac{dRC(\tau)}{dM_0} \) is immediate from the definition of \( \bar{\tau} \).

The interesting case here is when an increase in the exogenous power of the modern sector actually increases \( \tau \). This case emerges when the ex ante power of the modern sector was already high enough to force the old elite into the corner solution of \( \tau = \tau' \). This occurs only if \( \tau^{old} < \tau' \). Intuitively, the stronger exogenous power of the modern sector forces the old elite to increase its extraction rate to prevent the modern sector from driving it down in the future to very low levels of profit (i.e. when \( \tau = \tau^{min} \)).
There exists a second measure of strength of the old elite and the relative importance of the old sector. Namely the costs of building the new economy $c$ (case 1 in figure 4.2). This measures the costs of $RC$. It will affect the profit curve ($\tau^{old}$ increases due to the lower productivity of the modern sector) and the constraints ($RC(\tau)$ is lower hence less power is lost given a certain extraction rate).

**Proposition 4.** A increase in $c$ non-increases the equilibrium size of the modern sector in all circumstances.

**Proof.** An increase in $c$ strictly decreases $RC(\tau)$, increases $\tau^{old}$ and shifts $\bar{\tau}$ upwards (hence increasing each element in the set $\{\tau_A^{min}, \tau_A^{max}, \tau^{old}\}$ but decreasing $\tau^\prime$). When $\tau_A \in \{\tau_A^{min}, \tau_A^{max}, \tau^{old}\}$, it is thus immediate that $\tau$ will increase and $RC$ will thus decrease both directly and indirectly from the change in $c$. The only important case is thus $\tau_A = \tau_A^\prime$. To see that $RC$ must decrease, we need merely note that if it did not, then $\tau_B > \tau_A^\prime$ which would make the point infeasible. ■

5. Generalizations of the Model

In this section we relax the assumptions we made regarding the technology in our model. Our analysis was based on a simple and explicitly specified single input production function and on the time structure of the model that avoided dynamic aspects (expectations) of modern sector firms. Both we will discuss both issues in the following. We will concentrate on how these issues affect the intuition of the arguments made above.

The single input production function in itself not a serious simplification. It represents a reduced form. A standard general equilibrium model incorporating labor spend either on physical production, an outside sector, or on generation of contacts, will lead to similar insights. Thus it remains to be discussed what assumptions on $f(RC)$ are needed to derive our results. Whenever $f(RC)$ is continuous and exhibits decreasing returns to scale, we will see $\tau(RC(\tau))$ increasing in $\tau$. It depends on further assumptions whether $\tau(RC(\tau))$ has one, three or a
larger odd number of fixed points which determine the constraints of the maximization problem the old elite faces. What is important is that an old elite may not be at $\tau^{opt}$ but at one of the fixed-points which always allows cases where a more powerful old elite may imply a stronger growth of the modern sector than it is the case with the weaker elite. The interesting cases remain as long as there are at least 3 fixed points.

Regarding the dynamics, consider an extension where $RC$ is a stock that depreciates. Let us assume this rate is given by $\delta$. Thus $RC_t$ follows:

$$RC_t = (1 - \delta)RC_{t-1} + N_t.$$ 

If we now study the steady state of this problem we find that in any steady state, it will have to hold that an extra unit of relational capital for the individual firm is worth precisely nothing:

$$\frac{1}{\rho + \delta}(1 - \tau)f'\left(RC\right) = c$$

where the left-hand side is the discounted marginal value of an extra unit of $RC$ and the right-hand side the cost involved. We derive an implicit decreasing function $RC(\tau)$. And are qualitatively back to the model discussed above.

There is one difference though: The beliefs of the firms in the modern sector are then important in this model because they are in many situations self-fulfilling. This implies the possibility of a continuum of equilibria\textsuperscript{8}. To avoid indeterminacy we would then need a restrictions on beliefs. One candidate that supports the above made intuition is a focus on non-pessimistic equilibria: If there are two rational expectations equilibria, firms will coordinate on the one that gives them no lower expected pay-off than the current tax rates. A rationale for this is that firms after all able to coordinate a belief that things will not get worse. If we make

\textsuperscript{8}To give an example: suppose one is, as before, in an equilibrium situation of three fixed points, where at $t=0$, $\tau = \tau^{min}$ and $\tau^{old} > \tau'$. If all firms believe no other will invest, then they will expect $RC_{t+1} = \frac{RC_t}{1+\delta}$. If that value of $RC_{t+1}$ coincides with $\tau > \tau'$, firms will hence expect tax increases in the future which can rationalise the initial expectation. If on the other hand firms expect $RC_{t+1} = RC_t$, then this too must be a rational expectation.
this assumption, then we essentially exclude any path from which one may get
from one equilibrium to another one with a higher \( \tau \). This characteristic implies
path dependence (if one starts from \( \tau^{\text{min}} \), only a massive shock can get you to \( \tau' \)
or higher. The reverse may happen by choice). The rest of the previous analysis
however remains as before.\(^9\)

6. History Revisited and What is Happening in Uzbekistan?

We interpret the US in terms of Figure 1 to be a case where \( \tau \) had slipped below \( \tau' \)
without the colonial power (the UK) being aware of the actual balance of power.
The political strength apparently inherent in the US at that time had simply gone
unrecognized hitherto. We interpret Brazil as a colony where the colonial power
feared a similar event and hence set \( \tau \) equal to \( \tau^{\text{max}} \).

The history of industrialization as well as the different developments of tran-
sition economies provide a wealth of further experiences. We first want to discuss
shortly the European experience with industrialization. Similar to Acemoglu and
Robinson (2000), we concentrate on the case of Britain and Germany vs. Austria
and the Russian Empire.

As Acemoglu and Robinson (2000) argue, Britain and Germany initially had
more democratic institutions compared to Austria and Russia. This implied that
members of the modern sector had already in the beginning a larger say in the
politics of those countries. This concurs with our model where a large power
(\( M_0 \)) of the modern sector at the beginning of the development period helps to
develop a larger modern economy. To these observations, we add that Austria
and Russia had relatively large old sectors; the civic society of both countries was

\(^9\)This perhaps curious result follows from the fact that nothing constrains extra investments
in \( RC_t \) at any moment. Hence an old elite will immediately jump to \( \tau^{\text{old}} \) if that is in the choice
set because waiting carries no advantage. Otherwise an old elite in equilibrium will again be stuck
at one of the points \( \{\tau_A^{\text{min}}, \tau_A^{\text{max}}, \tau'\} \). This is because as long as modern sector firms minimally
believe taxes will not increase, their behaviour will limit the old elite to the same choice set as
in the case without dynamics).
less developed and more centralized than in Britain and Germany. Hence, the old elites had more to lose and the modern sector faced higher costs of building up a network. Furthermore, the political developments in other European countries might have warned the elites in Austria and Russia that a growing modern sector would demand political rights and hence decrease the rents to the old elite.

The second issue is the experiences of those transition economies that were resource poor compared with ‘natural resource’ economies. Why is it not the case that countries rich in natural resources use these resources to speed up the growth of a modern sector? Especially pertinent are the cases of the Arab Oil exporting countries like Oman, Saudi Arabia, and Kuwait. Our argument here is not only that there was little resource rent to fight over in the resource-poor transition countries compared to the middle east, but also that the old elite faced more initial political competition from an already partially developed new sector.

The richness of Asian CIS countries (incl. Uzbekistan) in natural resources could lead the old elite to actively discourage the growth of a modern sector. Furthermore, the lack of a civic society does not only erode the power of a modern sector at the beginning of the development, but it also increases the costs of building networks (see Frijters et al. (2003) for an elaborate model of social capital, civic society and the costs of building networks) which leaves more power to the old elite and reduces the potential of the modern sector. This latter explanation may explain too why the countries joining the EU in 2004 are more advanced in their development as for example Bulgaria and Romania.

Preventing a modern sector from growing can take many guises. Limits on education are a case in point. Not only did the old elites of the former USSR countries distributed the pie among them based upon there former formal power, the long period of Socialism laid the basis of real authority in the sense of Aghion and Tirole (1997), namely education and knowledge were eroded and had been only accessible to members of the system. Hence there was no opposition as there was for example in Poland or Czechoslovakia that was able to push the old elite aside.
<table>
<thead>
<tr>
<th>Country</th>
<th>Agr./Ind./Serv. GDP comp % (Lab. force %)</th>
<th>Industries (% of export)</th>
<th>∆GDP '95-00</th>
<th>Press Freed.</th>
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<tr>
<td>Armenia</td>
<td>30/26/44 (45/25/30)</td>
<td>diamonds, minerals, food</td>
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<td>59 PF-</td>
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<td>Azerbaijan</td>
<td>20/33/47 (41/7/52)</td>
<td>oil and gas (90)</td>
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<td>Belarus</td>
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<td>Estonia</td>
<td>5.8/28.6/65.6 (11/20/69)</td>
<td>machin,(33),wood(15), textiles(14), food (8)</td>
<td>0.397</td>
<td>20 F-</td>
</tr>
<tr>
<td>Georgia</td>
<td>20/25/55 (40/20/40)</td>
<td>machinery, chemicals</td>
<td>0.091</td>
<td>53 PF-</td>
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<tr>
<td>Kazakhstan</td>
<td>9/40/51 (20/30/50)</td>
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<tr>
<td>Latvia</td>
<td>4.5/26/69.5 (15/25/60)</td>
<td>wood, machinery, metals</td>
<td>0.268</td>
<td>24 F-</td>
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<td>Lithuania</td>
<td>8/31/61 (20/30/50)</td>
<td>miner.(23),text.(16),</td>
<td>0.272</td>
<td>20 F-</td>
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<td></td>
<td></td>
<td>machin.(11),chem.(6)</td>
<td></td>
<td></td>
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<tr>
<td>Moldova</td>
<td>28/23/49 (40/14/46)</td>
<td>food, textiles, machinery</td>
<td>-0.134</td>
<td>59 PF-</td>
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<tr>
<td>Russia</td>
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<td>chemicals</td>
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<tr>
<td>Tajikistan</td>
<td>19/26/55 (67.2/7.5/25.3)</td>
<td>aluminium,electricity,</td>
<td>0.306</td>
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<td>cotton, food</td>
<td>(96-00)</td>
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<td>Turkmenistan</td>
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<td>cotton/textiles(5)</td>
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<td>Ukraine</td>
<td>23/42/35 (24/32/44)</td>
<td>metals,fuel,chemicals,</td>
<td>-0.005</td>
<td>60 PF-</td>
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<td></td>
<td>machinery</td>
<td></td>
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<tr>
<td>Uzbekistan</td>
<td>36/21/43 (44/20/36)</td>
<td>cotto.(41.5), gold(9.6),</td>
<td>0.159</td>
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<td></td>
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<td>energy (9.6)</td>
<td>(94-66)</td>
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Sources: CIA Factb., CIA Factbook, PTab, PFS
7. Conclusions

We presented a model that showed that a powerful old elite may provided dis-incentives to modern sector to grow when this modern sector will affect the old elites ability to extract rents from the economy. The main argument is that a modern sector goes hand in hand with new networks that are not only production enhancing, but also affect politics.

We believe that this model adds to the understanding of historic developments mainly by shifting the focus from elite’s supposed aversion to technology to an aversion against network formation. Instead of viewing changes in a system as discrete policy changes - either in the form of discrete reforms or in the form of revolutions, we argue that elites always retain some power which gives them an interest in larger future economies.

In our historical analysis we interpreted the US as being ‘lucky’, i.e. as having been the first colony to experience the power of modern networks before its colonial ruler got wise to that power. We argue that Brazil, which in some sense had a large resource advantage compared to the US (and even some technological ‘firsts’) was unlucky. Its colonial ruler, the Queen of Portugal, in 1786 deliberately dismantled the growing manufacturing base of Brazil in favour of resource extraction and thereby prevented a US-type development path.

Besides its usefulness in the understanding of industrialization, the model also helps to understand the experiences of transition economies. All of the transition countries formally adopted a democracy, which meant the old elite had to defend its position by playing the democratic game. Nonetheless, those societies were the political base of a new sector was weak whilst natural resources were abundant saw reversed reforms after the break-up of the USSR. We also argue that regimes which are very highly entrenched in the sense of large ‘fixed’ political power have less to fear and may reform more than weaker regimes. This might explain why in growth regressions dictatorial regimes fare better in poor countries than democratic regimes. An unconstrained political power will allow more growth of a modern sector then a constrained one.
References


