Scand. J. of Economics 108(4), 515–546, 2006
DOI: 10.1111/j.1467-9442.2006.00460.x

A Simple Model of Inefficient Institutions

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Abstract

This paper develops a simple model of economic and political institutions that lead to poor aggregate economic performance. In the model economy, groups with political power, *the elite*, choose policies to increase their income and to directly or indirectly transfer resources from the rest of society to themselves. The resulting equilibrium is generally inefficient because of three distinct mechanisms: (1) revenue extraction, (2) factor price manipulation and (3) political consolidation. In particular, the elite may pursue inefficient policies to extract revenue from other groups. They may do so to reduce the demand for factors coming from other groups in the economy, thus indirectly benefiting from changes in factor prices. Finally, they may try to impoverish other groups competing for political power. The elite's preferences over inefficient policies translate into inefficient economic institutions. The notable exception to this general picture emerges when long-term investments are important, thus creating a commitment (holdup) problem, whereby equilibrium taxes and regulations are worse than the elite would like them to be from an *ex ante* point of view. In this case, economic institutions that provide additional security of property rights to other groups can be useful.

Keywords: Political economy; institutions; commitment; holdup; social conflict; economic development; taxation; property rights; regulation

JEL classification: $H2$; $N10$; $N40$; $O1$; $O10$; $P16$

I. Introduction

Despite a growing consensus on the importance of government policies and various forms of institutions on economic performance, and important theoretical advances in political economy, we still lack an organizational framework to analyze the determinants of institutions.[1] A central question that still remains unanswered is: if institutions matter (so much) for economic performance, why do societies choose or end up with "inefficient"

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* This is a modified and shortened version of Acemoglu (2006). I thank Alexandre Debs for suggestions and excellent research assistance and Timothy Besley, Gerard Padro-i-Miquel, Torsten Persson, James Robinson, Pierre Yared and two anonymous referees for comments and suggestions.

[1] See the companion paper Acemoglu (2006) for a more detailed discussion of the historical, empirical and theoretical literature on the role of institutions in economic performance and some references to the recent contributions to the theory of political economy.

institutions that do not maximize economic growth or aggregate economic welfare?[2]

To understand why inefficient institutions emerge and persist, we first need to understand: (i) what type of equilibrium policies and allocations emerge within different institutional frameworks; and (ii) the preferences of different individuals and groups over these policies and allocations. This will enable us to derive *induced preferences* over institutions. Inefficient institutions will emerge and persist, in turn, when groups that prefer the inefficient (non-growth-enhancing) policies that these institutions generate are sufficiently powerful, and when other social arrangements that compensate these powerful groups, while reaching more efficient allocations, cannot be found.

The model economy in this paper includes three groups: workers, elite producers and non-elite (middle-class) producers. The latter two groups have access to investment opportunities with varying degrees of productivity. The key policies in the model are taxes imposed on producers.[3] The model is first used to highlight various sources of inefficiencies in policies:

(i) *Revenue extraction:* the elite—the group in power—will set distortionary taxes on middle-class producers in order to extract resources from them. This source of inefficiency results from the absence of non-distortionary taxes, which implies that the distribution of resources cannot be decoupled from efficient production.

(ii) *Factor price manipulation:* the elite may want to tax middle-class producers in order to reduce the prices of the factors they use in production. This inefficiency arises because the elite and middle-class producers compete for factors (here labor). By taxing middle-class producers, the elite ensure lower factor prices and thus higher profits for themselves.

(iii) *Political consolidation:* to the extent that the political power of the middle-class depends on their economic resources, greater

[2] A potentially weaker definition of "inefficiency" would be Pareto inefficiency, whereby a set of institutions would be Pareto inefficient if a different set of institutions would make everybody better off. This definition, though important for certain theoretical analyses, is too weak in the context of political economy discussions, since one set of institutions may enrich a particular narrow social group, while causing stagnation or low growth for society at large, and we may wish to refer to this set of institutions as "inefficient" .

[3] This should be interpreted as an example standing for many other forms of distortionary ways of transferring resources from one group to another. These include simple violations of property rights (as, for example, when land tenure is removed or assets are expropriated from certain groups), entry barriers (used to indirectly transfer resources from more efficient to less efficient producers or to manipulate factor prices, as we will see below), or other distortionary policies, for example, the use of marketing boards in order to depress the prices paid for certain agricultural products.

middle-class profits reduce the elite's political power and endanger their future rents. The elite will then want to tax the middle class in order to impoverish them and consolidate their political power.

Although all three inefficiencies in policies arise because of the desire of the elite to extract rents from the rest of society, the analysis reveals that of the three sources of inefficiency, the revenue extraction is typically the least harmful, since, in order to extract revenues, the elite need to ensure that the middle class undertakes efficient investments. In contrast, the factor price manipulation and political consolidation mechanisms encourage the elite to directly impoverish the middle class. An interesting comparative static result is that greater state capacity shifts the balance towards the revenue extraction mechanism, and thus, by allowing the elite to extract resources more efficiently from other groups, may improve the allocation of resources.

Additional inefficiencies arise when other groups in society undertake long-term investments. In this case, an important portion of the tax (or expropriation) decisions by the elite are made after investments are sunk, creating a natural "commitment problem"; the elite may renege on policy promises once key investments are made. With this type of *holdup problem*, taxes are typically higher and more distortionary, and thus aggregate economic performance is worse.

The obvious—but still important point—is that inefficiencies in policies translate into inefficient institutions. Institutions determine the framework for policy determination, and economic institutions determine both the limits of various redistributive policies and other rules and regulations that affect the economic transactions. In the context of the simple model here, I associate economic institutions with two features: limits on taxation and redistribution, and regulation on the technology used by middle-class producers. The same forces that lead to inefficient policies imply that there will be reasons for the elite to choose inefficient economic institutions. In particular, they may not want to guarantee enforcement of property rights for middle-class producers or they may prefer to block technology adoption by middle-class producers. Holdup problems, which imply equilibrium taxes even higher than those preferred by the elite, create a possible exception, and may encourage the elite to use economic institutions to place credible limits on their own future policy choices. This suggests that economic institutions that restrict future policies may be more likely to arise in economies in which there are more longer-term investments and thus more room for holdup.

The model also sheds light on the conditions under which economic institutions discourage or block technology adoption. If the source of inefficiencies in policies is revenue extraction, the elite always wish to encourage the adoption of the most productive technologies by the middle class. However, when the source of inefficiency is factor price manipulation or political consolidation, the elite may want to *block* the adoption of more efficient technologies, or at the very least, they would choose not to invest in activities that would increase the productivity of middle-class producers (for example, public goods). This again reiterates that when the factor price manipulation and political consolidation mechanisms are at work, significantly more inefficient outcomes can emerge.

I conclude the paper with a brief discussion of two important issues: (i) The implications of different political institutions (different distributions of *de jure* power across groups) depend on the relative productivities of different groups. For example, the dictatorship of the middle class is more efficient than the dictatorship of the elite when the middle-class producers are more productive, but less efficient when the elite have access to more productive investment opportunities. Whether democracy is more or less efficient than the other two regimes depends on the impact of taxes on equilibrium wages; when wages are sufficiently responsive to taxes, democracy will pursue less distortionary policies than other regimes. (ii) Even though concentrating political power in the hands of the elite may have limited costs when the elite are sufficiently productive, such a system may still create long-run economic costs; for example, a change in the productivity of the elite relative to the middle class could make a different distribution of political power more beneficial. In this case, existing institutions, which may have previously functioned relatively well, become inappropriate to the new economic environment.

The rest of the paper is organized as follows. Section II presents the basic economic model and characterizes the equilibrium for a given sequence of policies. Section III analyzes the revenue extraction, factor price manipulation and political consolidation mechanisms, and also discusses holdup problems and distortions in the process of technology adoption. Section IV analyzes inefficient economic institutions, while Section V discusses the relative (in)efficiency of different political institutions. Section VI concludes.

II. Baseline Model

Environment

Consider an infinite-horizon economy populated by a continuum $1 + \theta_e + \theta_m$ of risk-neutral agents, each with a discount factor equal to $\beta < 1$. There is a unique non-storable final good denoted by y. The expected utility of agent j at time 0 is given by:

$$U_0^j = \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t c_t^j, \tag{1}$$

where $c_t^j \in \mathbb{R}$ denotes the consumption of agent j at time t and $\mathbb{E}_t$ is the expectations operator conditional on information available at time t.

Agents are in three groups. The first are workers, whose only action in the model is to supply their labor inelastically. There is a total mass 1 of workers. The second is the elite, denoted by e, who initially hold political power in this society. There is a total of θ^e elites. Finally, there are θ^m "middle-class" agents, denoted by m. The sets of elite and middle-class producers are denoted by S^e and S^m, respectively. I use j to denote either individual or group.

Each member of the elite and middle class has access to production opportunities, represented by the production function

$$y_t^j = \frac{1}{1-\alpha} \left(A_t^j\right)^{\alpha} \left(k_t^j\right)^{1-\alpha} \left(l_t^j\right)^{\alpha}, \tag{2}$$

where k denotes capital or intermediate goods and l labor. Capital is assumed to depreciate fully after use, and is financed within the period (in a way analogous to models with intermediate goods with an input–output structure). The Cobb–Douglas form is adopted for simplicity.

The key difference between the two groups is in their productivity. The productivity of each elite agent is A^e in each period, and that of each middle-class agent is A^m. Productivity of the two groups differs, for example, because they are engaged in different economic activities (e.g. agriculture versus manufacturing, old versus new industries, etc.), or because they have different human capital or talent.

On the policy side, there are activity-specific tax rates on production, τ^e and τ^m, which are constrained to be nonnegative, i.e., $\tau^e \geq 0$ and $\tau^m \geq 0$. There are no other fiscal instruments (in particular, no lump-sum nondistortionary taxes). In addition there is a total income (rent) of R from natural resources. The proceeds of taxes and revenues from natural resources can be redistributed as nonnegative lump-sum transfers targeted towards each group, $T^w \geq 0$, $T^m \geq 0$ and $T^e \geq 0$.[4]

[4] The assumption that taxes and transfers are nonnegative are standard in the literature (which, naturally, does not make them innocuous). The nonnegativity of transfers will play an important role in the analysis by forcing redistributive policies to be distortionary. Although this structure of fiscal instruments can be motivated as resulting from the nature of "economic institutions" in place, a more satisfactory micro-founded justification would come from informational and incentive problems that restrict the form of tax-transfer instruments. The most straightforward justification, however, is that in such simple settings if lump-sum taxes are allowed, redistribution can be decoupled from efficiency considerations. Hence, restricting attention to linear taxes is a reduced-form way of linking redistribution and efficiency.

The parameter $\phi \in [0,1]$ measures how much of the tax revenue can be redistributed. This parameter, therefore, captures "state capacity", i.e., the ability of the states to penetrate and regulate the production relations in society (though it does so in a highly "reduced-form" way). When $\phi = 0$, state capacity is limited and all tax revenue gets lost, whereas when $\phi = 1$ we can think of a society with substantial state capacity that is able to raise taxes and redistribute the proceeds as transfers. The government budget constraint is

$$T_t^w + \theta^m T_t^m + \theta^e T_t^e \leq \phi \int_{j \in S^e \cup S^m} \tau_t^j y_t^j dj + R. \tag{3}$$

Let us also assume that there is a maximum scale for each firm, so that $l_t^j \leq \lambda$ for all j and t. This prevents the most productive agents in the economy from employing the entire labor force. Since only workers can be employed, the labor market-clearing condition is

$$\int_{j \in S^e \cup S^m} l_t^j dj \leq 1, \tag{4}$$

with equality corresponding to full employment. Since $l_t^j \leq \lambda$, (4) implies that if

$$\theta^e + \theta^m \leq \frac{1}{\lambda}, \tag{ES}$$

there can never be full employment. Consequently, depending on whether condition (ES) holds, there will be excess demand or excess supply of labor in this economy. Throughout, I also assume that

$$\theta^e \leq \frac{1}{\lambda} \quad \text{and} \quad \theta^m \leq \frac{1}{\lambda}, \tag{A1}$$

which ensures that neither of the two groups will create excess demand for labor by itself. Assumption (A1) is adopted only for convenience and simplifies the notation (by reducing the number of cases that need to be studied).

Economic Equilibrium

I first characterize the economic equilibrium for a given sequence of taxes, $\{\tau_t^e, \tau_t^m\}_{t=0,1,\ldots,\infty}$ (the transfers do not affect the economic equilibrium). An *economic equilibrium* is defined as a sequence of wages $\{w_t\}_{t=0,1,\ldots,\infty}$, and investment and employment levels for all producers, $\{[k_t^j, l_t^j]_{j \in S^e \cup S^m}\}_{t=0,1,\ldots,\infty}$ such that given $\{\tau_t^e, \tau_t^m\}_{t=0,1,\ldots,\infty}$ and $\{w_t\}_{t=0,1,\ldots,\infty}$, all producers choose their investment and employment optimally and the labor market clears.

Each producer (firm) takes wages as given. Finally, given the absence of adjustment costs and full depreciation of capital, firms simply maximize current net profits. Consequently, the optimization problem of each firm can be written as

$$\max_{k_t^j, l_t^j} \frac{1-\tau_t^j}{1-\alpha}(A^j)^\alpha \left(k_t^j\right)^{1-\alpha}\left(l_t^j\right)^\alpha - w_t l_t^j - k_t^j,$$

where $j \in S^e \cup S^m$. This maximization yields

$$k_t^j = \left(1-\tau_t^j\right)^{1/\alpha} A^j l_t^j \tag{5}$$

and

$$l_t^j \begin{cases} = 0 & \text{if } w_t > \dfrac{\alpha}{1-\alpha}\left(1-\tau_t^j\right)^{1/\alpha} A^j \\ \in [0, \lambda] & \text{if } w_t = \dfrac{\alpha}{1-\alpha}\left(1-\tau_t^j\right)^{1/\alpha} A^j \\ = \lambda & \text{if } w_t < \dfrac{\alpha}{1-\alpha}\left(1-\tau_t^j\right)^{1/\alpha} A^j. \end{cases} \tag{6}$$

In equation (6), the expression $\alpha(1-\tau_t^j)^{1/\alpha}A^j/(1-\alpha)$ is the net marginal product of a worker employed by a producer of group j. If the wage is above this amount, this producer would not employ any workers, and if it is below, he or she would prefer to hire as many workers as possible (i.e., up to the maximum, λ). Second, equation (5) highlights the source of potential inefficiency in this economy. Producers invest in physical capital but only receive a fraction $(1-\tau_t^j)$ of the revenues. Therefore, taxes discourage investments, creating potential inefficiencies.

Combining (6) with (4), equilibrium wages are obtained as follows:

(i) If condition (ES) holds, there is excess supply of labor and $w_t = 0$.
(ii) If condition (ES) does not hold, then there is "excess demand" for labor and the equilibrium wage is

$$w_t = \min\left\langle \frac{\alpha}{1-\alpha}\left(1-\tau_t^e\right)^{1/\alpha} A^e, \frac{\alpha}{1-\alpha}\left(1-\tau_t^m\right)^{1/\alpha} A^m \right\rangle. \tag{7}$$

The form of the equilibrium wage is intuitive. Labor demand comes from two groups, the elite and middle-class producers, and when condition (ES) does not hold, their total labor demand exceeds available labor supply, so the market-clearing wage will be the minimum of their net marginal product.

One interesting feature, which will be used below, is that when condition (ES) does not hold, the equilibrium wage is equal to the net productivity of one of the two groups of producers, so either the elite or the middle class will make zero profits in equilibrium.

Finally, the equilibrium level of aggregate output is

$$Y_t = \frac{1}{1-\alpha}\left(1-\tau_t^e\right)^{(1-\alpha)/\alpha} A^e \int_{j\in S^e} l_t^j\, dj + \frac{1}{1-\alpha}\left(1-\tau_t^m\right)^{(1-\alpha)/\alpha} A^m \int_{j\in S^m} l_t^j\, dj + R. \tag{8}$$

An equilibrium in this economy, given sequence of taxes $\{\tau_t^e, \tau_t^m\}_{t=0,1,\dots,\infty}$, therefore takes the following simple form: if condition (ES) holds, then $w_t = 0$, and if condition (ES) does not hold, then w_t is given by (7). Given the wage sequence, factor demands are given by (5) and (6), and aggregate output is given by (8).

III. Inefficient Policies

We start with political institutions corresponding to the "dictatorship of the elite", and thus focus on the elite's desired policies. The main (potentially inefficient) policy will be a tax on middle-class producers, which will lead to three distinct mechanisms of inefficiency; (1) Resource Extraction; (2) Factor Price Manipulation; and (3) Political Consolidation.

To illustrate each mechanism in the simplest possible way, I will focus on a subset of the parameter space and abstract from other interactions. Throughout, I assume that there is an upper bound on taxation, so that $\tau_t^m \le \bar{\tau}$ and $\tau_t^e \le \bar{\tau}$, where $\bar{\tau} \le 1$. This limit can be institutional, or may arise because of the ability of producers to hide their output or shift into informal production.

The timing of events within each period is as follows: first, taxes are set; then, investments are made (see below on holdup problems arising from different timings).

To start with, I focus on Markov-perfect equilibria (MPE) of this economy, where strategies are only dependent on payoff-relevant variables. In this context, this means that strategies are independent of past taxes and investments (since there is full depreciation). In the dictatorship of the elite, policies will be chosen to maximize the elite's utility. Hence, a *political equilibrium* is given by a sequence of policies $\{\tau_t^e, \tau_t^m, T_t^w, T_t^m, T_t^e\}_{t=0,1,\dots,\infty}$ (satisfying (3)) which maximizes the elite's utility, taking the economic equilibrium as a function of the sequence of policies as given.

Substituting (5) into (2), we obtain elite consumption as

$$c_t^e = \left[\frac{\alpha}{1-\alpha}\left(1-\tau_t^e\right)^{1/\alpha} A^e - w_t\right] l_t^e + T_t^e, \tag{9}$$

with w_t given by (7). This expression follows immediately by recalling that the first term in square brackets is the after-tax profits per worker, while the second term is the equilibrium wage. Total per elite consumption is given by their profits plus the lump-sum transfer they receive. Then the political equilibrium, starting at time $t=0$, is simply given by a sequence of $\{\tau_t^e, \tau_t^m, T_t^w, T_t^m, T_t^e\}_{t=0,1,\ldots,\infty}$ that satisfies (3) and maximizes the discounted utility of the elite, $\sum_{t=0}^{\infty}\beta^t c_t^e$. The determination of the political equilibrium is simplified further by the fact that in the MPE with full capital depreciation, this problem is simply equivalent to maximizing (9). We now characterize this political equilibrium under a number of different scenarios.

Revenue Extraction

Suppose now that condition (ES) holds, so wages are constant at zero. This removes any effect of taxation on factor prices. In this case, from (6), we also have $l_t^j=\lambda$ for all producers. Also assume that $\phi>0$ (for example, $\phi=1$).

It is straightforward to see that the elite will never tax themselves, so $\tau_t^e=0$, and will redistribute all of the government revenues to themselves, so $T_t^w=T_t^m=0$. Consequently taxes will be set in order to maximize tax revenue, given by

$$\text{Revenue}_t = \frac{\phi}{1-\alpha}\tau_t^m\left(1-\tau_t^m\right)^{(1-\alpha)/\alpha}A^m\lambda\theta^m + R \tag{10}$$

at time t. The first term is obtained by substituting for $l_t^m=\lambda$ and for (5) into (2) and multiplying it by τ_t^m, and taking into account that there are θ^m middle-class producers and a fraction ϕ of tax revenues can be redistributed. The second term is simply the revenues from natural resources. It is clear that tax revenues are maximized by $\tau_t^m=\alpha$. In other words, this is the tax rate that puts the elite at the peak of their "Laffer curve". In contrast, output maximization would require $\tau_t^m=0$. However, the output-maximizing tax rate is not an equilibrium because, despite the distortions, the elite would prefer a higher tax rate to increase their own consumption.

At the root of this inefficiency is a limit on the tax instruments available to the elite. If they could impose lump-sum taxes that would not distort investment, these would be preferable. Inefficient policies here result from the redistributive desires of the elite coupled with the absence of lump-sum taxes.

It is also interesting to note that as α increases, the extent of distortions is reduced, since there are greater diminishing returns to capital and investment will not decline much in response to taxes.[5]

Even though $\tau_t^m=\alpha$ is the most preferred tax for the elite, the exogenous limit on taxation may become binding, so the equilibrium tax is

$$\tau_t^m = \tau^{RE} \equiv \min\{\alpha, \bar{\tau}\} \tag{11}$$

[5] More explicitly, (5) implies that $\partial^2 \ln k_t^j/\partial\tau_t^j\partial\alpha = 1/(\alpha^2(1-\tau_t^j))>0$.

for all t. Equilibrium taxes thus depend only on the production technology (in particular, how distortionary taxes are) and on the exogenous limit on taxation. For example, as α decreases (so that the production function becomes more linear in capital), equilibrium taxes decline.

This discussion is summarized in the following proposition (proof in the text):

Proposition 1. *Suppose assumptions (A1) and condition (ES) hold and* $\phi > 0$, *then the unique political equilibrium features* $\tau_t^m = \tau^{RE} \equiv \min\{\alpha, \bar{\tau}\}$ *for all* t.

Factor Price Manipulation

I now investigate how inefficient policies can arise in order to manipulate factor prices. To highlight this mechanism in the simplest possible way, let us first assume that $\phi = 0$ so that there are no direct benefits from taxation for the elite. There are indirect benefits, however, because of the effect of taxes on factor prices, which will be present as long as the equilibrium wage is positive, i.e., as long as condition (ES) does not hold. Let us also assume that

$$(1 - \bar{\tau})^{1/\alpha} A^m < A^e, \tag{A2}$$

which implies that when the middle class is taxed at the rate $\bar{\tau}$, their net productivity will be lower than that of the elite, and from (7) the equilibrium wage will be $w_t = \alpha(1 - \bar{\tau})^{1/\alpha} A^m/(1 - \alpha)$.

Inspection of (7) and (9) then immediately reveals that the elite prefer high taxes in order to reduce the labor demand from the middle class, and thus wages, as much as possible. The desired tax rate for the elite is thus $\tau_t^m = 1$. Given constraints on taxation, the equilibrium tax is $\tau_t^m = \tau^{FPM} \equiv \bar{\tau}$ for all t. We therefore have (proof in the text):

Proposition 2. *Suppose assumptions (A1) and (A2) hold, condition (ES) does not hold, and* $\phi = 0$, *then the unique political equilibrium features* $\tau_t^m = \tau^{FPM} \equiv \bar{\tau}$ *for all* t.

This result suggests that the factor price manipulation mechanism generally leads to higher taxes and worse distortions than the pure revenue extraction mechanism. This is because, with the factor price manipulation mechanism, the objective of the elite is to reduce the profitability of the middle class as much as possible, whereas for revenue extraction, the elite would like the middle class to invest and generate revenues. It is also worth noting that, differently from the pure revenue extraction case, the tax policy of the elite is not only extracting resources from the middle class, but it is also doing so indirectly from the workers, whose wages are being reduced because of the tax policy.[6]

The role of $\phi = 0$ also needs to be emphasized. Taxing the middle class at the highest rate is clearly inefficient. Why is there not a more efficient way of transferring resources to the elite? The answer relates to the limited fiscal instruments available to the elite (recall the discussion in footnote 4). In particular, $\phi = 0$ implies that they cannot use taxes at all to extract revenues from the middle class, so they are forced to use inefficient means of increasing their consumption, by directly impoverishing the middle class. In the next subsection, I discuss how the factor price manipulation mechanism works in the presence of an instrument that can directly raise revenue from the middle class. This will illustrate that the absence of any means of transferring resources from the middle class to the elite is not essential for the factor price manipulation mechanism (though the absence of non-distortionary lump-sum taxes is naturally important).

Revenue Extraction and Factor Price Manipulation Combined

By itself the factor price manipulation effect led to the extreme result that the tax on the middle class should be as high as possible. Revenue extraction, though typically another motive for imposing taxes on the middle class, will serve to reduce the power of the factor price manipulation effect. The reason is that high taxes also reduce the revenues extracted by the elite (moving the economy *beyond the peak* of the Laffer curve), and are costly to the elite.

To characterize the equilibrium in this case again necessitates the maximization of (9). This is simply the same as maximizing transfers minus the wage bill for each elite producer. As before, transfers are obtained from (10), while wages are given by (7). When condition (ES) holds and there is an excess supply of labor, wages are equal to zero, and we obtain the same results as in the case of pure resource extraction.

The interesting case is the one where (ES) does not hold, so that wages are not equal to zero, and are given by the minimum of the two expressions in (7). Incorporating the fact that the elite will not tax themselves and will redistribute all the revenues to themselves, the maximization problem can be written as

[6] The factor price manipulation effect in this model is similar to the role of entry barriers in reducing wages in Acemoglu (2003). This mechanism is also related to, though distinct from, that in other models, where incumbents block the adoption or use of efficient technologies by others; for example, Olson (1982) and Parente and Prescott (1999).

$$\max_{\tau_t^m}\left[\frac{\alpha}{1-\alpha}A^e - w_t\right]l_t^e + \frac{1}{\theta^e}\left[\frac{\phi}{1-\alpha}\tau_t^m\left(1-\tau_t^m\right)^{(1-\alpha)/\alpha}A^m l_t^m \theta^m + R\right], \tag{12}$$

subject to (7) and

$$\theta^e l_t^e + \theta^m l_t^m = 1 \tag{13}$$

and

$$l_t^m = \lambda \quad \text{if } \left(1-\tau_t^m\right)^{1/\alpha} A^m \geq A^e. \tag{14}$$

The first term in (12) is the elite's net revenues and the second term is the transfer they receive. Equation (13) is the market-clearing constraint, while (14) ensures that middle-class producers employ as much labor as they wish provided that their net productivity is greater than those of elite producers.

The solution to this problem can take two different forms depending on whether (14) holds in the solution. If it does, then $w = \alpha A^e/(1-\alpha)$, and elite producers make zero profits and their only income is derived from transfers. Intuitively, this corresponds to the case where the elite prefer to let the middle-class producers undertake all of the profitable activities and maximize tax revenues. If, on the other hand, (14) does not hold, then the elite generate revenues both from their own production and from taxing the middle-class producers. In this case $w = \alpha(1-\tau^m)^{1/\alpha}A^m/(1-\alpha)$. Rather than provide a full taxonomy, I impose the following assumption:

$$A^e \geq \phi(1-\alpha)^{(1-\alpha)/\alpha} A^m \frac{\theta^m}{\theta^e}, \tag{A3}$$

which ensures that the solution will always take the latter form (i.e., (14) does not hold). Intuitively, this condition makes sure that the productivity gap between the middle-class and elite producers is not so large as to make it attractive for the elite to make zero profits themselves (recall that $\phi(1-\alpha)^{(1-\alpha)/\alpha} < 1$, so if $\theta^e = \theta^m$ and $A^e = A^m$, this condition is always satisfied).[7]

[7] To see why this condition is sufficient for (14) not to hold, first use (13) (and drop the R term, which plays no role here) to write the objective of an elite agent as $(\alpha A^e/(1-\alpha) - w)\, l^e + \phi\tau^m(1-\tau^m)^{(1-\alpha)/\alpha}A^m(1-l^e)/(1-\alpha)\theta^e$. The maximum of this expression when (14) holds is $U^1 = \phi\alpha(1-\alpha)^{(1-\alpha)/\alpha}A^m\theta^m\lambda/(1-\alpha)\theta^e$. When it does not hold, let the value be $\max_{\tau^m} U^2(\tau^m)$. Note that when $\tau^m = 1$, we have $w = 0$ and $U^2(\tau^m = 1) = \alpha A^e\lambda/(1-\alpha)$, so when assumption (A2) holds

$$\max_{\tau^m} U^2(\tau^m) > U^2(\tau^m = 1) = \alpha A^e \lambda/(1-\alpha) \geq U^1,$$

establishing that (A3) is sufficient for the elite to prefer a tax policy that yields positive profits for them.

Consequently, when (A3) holds, we have $w_t = \alpha(1-\tau_t^m)^{1/\alpha} A^m \tau_t^m/(1-\alpha)$, and the elite's problem simply boils down to choosing τ_t^m to maximize

$$\frac{1}{\theta^e}\left[\frac{\phi}{1-\alpha}\tau_t^m\left(1-\tau_t^m\right)^{(1-\alpha)/\alpha} A^m l^m \theta^m + R\right] - \frac{\alpha}{1-\alpha}\left(1-\tau_t^m\right)^{1/\alpha} A^m \lambda, \tag{15}$$

where I have used the fact that all elite producers will employ λ employees, and from (13), $l_m = (1-\lambda\theta^e)/\theta^m$.

The maximization of (15) gives

$$\frac{\tau_t^m}{1-\tau_t^m} = \kappa(\lambda, \theta^e, \alpha, \phi) \equiv \frac{\alpha}{1-\alpha}\left(1 + \frac{\lambda\theta^e}{(1-\lambda\theta^e)\phi}\right).$$

The first interesting feature is that $\kappa(\lambda, \theta^e, \alpha, \phi)$ is always less than ∞. This implies that τ_t^m is always less than 1, which is the desired tax rate in the case of pure factor price manipulation. Moreover, $\kappa(\lambda, \theta^e, \alpha, \phi)$ is strictly greater than $\alpha/(1-\alpha)$, so that τ_t^m is always greater than α, the desired tax rate with pure resource extraction. Therefore, the factor price manipulation motive always increases taxes above the pure revenue-maximizing level (beyond the peak of the Laffer curve), while the revenue maximization motive reduces taxes relative to the pure factor price manipulation case. Naturally, if this level of tax is greater than $\bar{\tau}$, the equilibrium tax will be $\bar{\tau}$, i.e.,

$$\tau_t^m = \tau^{COM} \equiv \min\left\{\frac{\kappa(\lambda, \theta^e, \alpha, \phi)}{1+\kappa(\lambda, \theta^e, \alpha, \phi)}, \bar{\tau}\right\}. \tag{16}$$

It is also interesting to look at the comparative statics of this tax rate. First, as ϕ increases, taxation becomes more beneficial (generates greater revenues), but τ^{COM} declines. This might at first appear paradoxical, since one may have expected that as taxation becomes less costly, taxes should increase. Intuition for this result follows from the observation that an increase in ϕ raises the importance of revenue extraction, and, as commented above, in this case, revenue extraction is a force towards lower taxes (it makes it more costly for the elite to move beyond the peak of the Laffer curve). Since the parameter ϕ is related, among other things, to state capacity, this comparative static result suggests that higher state capacity will translate into lower taxes, because greater state capacity enables the elite to extract revenues from the middle class through taxation, without directly impoverishing them. In other words, greater state capacity enables more efficient forms of resource extraction by the groups holding political power.[8]

[8] This is a very different argument for why greater state capacity may be good for economic outcomes than the standard view, for example, espoused in Evans (1995).

Second, as θ^e increases and the number of elite producers increases, taxes also increase. The reason for this effect is again the interplay between the revenue extraction and factor price manipulation mechanisms. When there are more elite producers, reducing factor prices becomes more important relative to gathering tax revenue. One interesting implication of this discussion is that when the factor price manipulation effect is more important, there will typically be greater inefficiencies. Finally, an increase in α raises taxes for exactly the same reason as above; taxes create fewer distortions and this increases the revenue-maximizing tax rate. Summarizing the analysis (proof in the text):

Proposition 3. *Suppose assumptions (A1), (A2) and (A3) hold, condition (ES) does not hold, and $\phi > 0$. Then the unique political equilibrium features $\tau_t^m = \tau^{COM}$ as given by (16) for all t. Equilibrium taxes are increasing in θ^e and α and decreasing in ϕ.*

Political Consolidation

I now discuss the inefficiencies resulting from the desire of the elite to preserve their political power. This mechanism has been absent so far, since the elite were assumed to always remain in power. To illustrate it, the model needs to be modified to allow for endogenous switches of power. Institutional change will be discussed in greater detail later. For now, let us assume that there is a probability p_t in period t that political power permanently shifts from the elite to the middle class. Once they come to power, the middle class will pursue a policy that maximizes their own utility. When this probability is exogenous, the previous analysis still applies. Interesting economic interactions arise when this probability is endogenous. Here I will use a simple (reduced-form) model to illustrate the trade-offs and assume that this probability is a function of the income level of the middle-class agents, in particular

$$p_t = p\left(\theta^m c_t^m\right) \in [0, 1], \tag{17}$$

where I have used the fact that income is equal to consumption.[9] Let us assume that p is continuous and differentiable with derivative $p' > 0$, which captures the fact that when the middle-class producers are richer, they have greater *de facto* political power. This reduced-form formulation might capture a variety of mechanisms. For example, when the middle class are richer, they may be more successful in solving their collective action problems or they may increase their military power.

[9] Alternatively, one can assume, with qualitatively identical results, that it is the income of the middle-class relative to that of the elite that matters for political power.

This modification implies that the fiscal policy that maximizes current consumption may no longer be optimal. To investigate this issue we now write the utility of elite agents recursively, and denote it by $V^e(E)$ when they are in power and by $V^e(M)$ when the middle class is in power. Naturally, we have

$$V^e(E)=\max_{\tau_t^m}\left\{\left[\frac{\alpha}{1-\alpha}A^e - w_t\right]l_t^e+\frac{1}{\theta^e}\left[\frac{\phi}{1-\alpha}\tau_t^m\left(1-\tau_t^m\right)^{(1-\alpha)/\alpha}A^m l_t^m\theta^m+R\right]\right.$$
$$\left.+\beta\left[(1-p_t)V^e(E)+p_tV^e(M)\right]\right\}$$

subject to (7), (13), (14) and (17), with

$$p_t = p\left(\frac{\alpha}{1-\alpha}\left(1-\tau_t^m\right)^{1/\alpha}A^m l_t^m\theta^m - w_t l_t^m\theta^m\right).$$

I wrote $V^e(E)$ and $V^e(M)$, not as functions of time, since the structure of the problem makes it clear that these values will be constant in equilibrium.[10]

The first observation is that if the solution to the static problem involves $c_t^m=0$, then the same fiscal policy is optimal despite the risk of losing power. This implies that, as long as condition (ES) does not hold and (A3) holds, the political consolidation mechanism does not add an additional motive for inefficient taxation.

To see the role of the political consolidation mechanism, suppose instead that condition (ES) holds. In this case, $w_t=0$ and the optimal static policy is $\tau_t^m=\tau^{RE}\equiv\min\{\alpha,\bar{\tau}\}$ as discussed above and implies positive profits and consumption for middle-class agents. The dynamic maximization problem then becomes

$$V^e(E)=\max_{\tau_t^m}\left\{\frac{\alpha}{1-\alpha}A^e\lambda+\frac{1}{\theta^e}\left[\frac{\phi}{1-\alpha}\tau_t^m\left(1-\tau_t^m\right)^{(1-\alpha)/\alpha}A^m\lambda\theta^m+R\right]\right.$$
$$\left.+\beta\left[V^e(E)-p\left(\frac{\alpha}{1-\alpha}\left(1-\tau_t^m\right)^{1/\alpha}A^m\theta^m\lambda\right)\left(V^e(E)-V^e(M)\right)\right]\right\}. \tag{18}$$

The first-order condition for an interior solution can be expressed as

$$\phi-\phi\frac{1-\alpha}{\alpha}\frac{\tau_t^m}{1-\tau_t^m}$$
$$+\beta\theta^e p'\left(\frac{\alpha}{1-\alpha}\left(1-\tau_t^m\right)^{1/\alpha}A^m\theta^m\lambda\right)\left(V^e(E)-V^e(M)\right)=0.$$

It is clear that when $p'(\cdot)=0$, we obtain $\tau_t^m=\tau^{RE}\equiv\min\{\alpha,\bar{\tau}\}$ as above. However, when $p'(\cdot)>0$, $\tau_t^m=\tau^{PC}>\tau^{RE}\equiv\min\{\alpha,\bar{\tau}\}$ as long as

[10] See Acemoglu (2006) for the explicit expressions for $V^e(E)$ and $V^m(E)$.

$V^e(E) - V^e(M) > 0$. That $V^e(E) - V^e(M) > 0$ is the case is immediate since when the middle class are in power, they get to tax the elite and receive all of the transfers.

Intuitively, as with the factor price manipulation mechanism, the elite tax *beyond the peak* of the Laffer curve, yet know not to increase their revenues, but to consolidate their political power. These high taxes reduce the income of the middle class and their political power. Consequently, there is a higher probability that the elite remain in power in the future, enjoying the benefits of controlling the fiscal policy.[11]

An interesting comparative static is that as R increases, the gap between $V^e(E)$ and $V^e(M)$ increases, and the tax that the elite sets increases as well. Intuitively, the party in power receives the revenues from natural resources, R. When R increases, the elite become more willing to sacrifice tax revenue (by overtaxing the middle class) in order to increase the probability of remaining in power, because remaining in power has now become more valuable. This contrasts with the results so far where R had no effect on taxes. More interestingly, a higher ϕ, i.e., greater state capacity, also increases the gap between $V^e(E)$ and $V^e(M)$—because this enables the group in power to raise more tax revenues—and thus implies a higher tax rate on the middle class. Intuitively, when there is no political competition, greater state capacity, by allowing more efficient forms of transfers, improves the allocation of resources. But in the presence of political competition, by increasing the *political stakes*, it leads to greater conflict and more distortionary policies.

Summarizing this discussion (proof in the text):

Proposition 4. *Consider the economy with political replacement. Suppose also that assumption (A1) and condition (ES) hold and* $\phi > 0$, *then the political equilibrium features* $\tau_t^m = \tau^{PC} > \tau^{RE}$ *for all* t. *This tax rate is increasing in* R *and* ϕ.

Subgame-perfect versus Markov-perfect Equilibria

It is also useful to note that none of the results so far depends on the restriction to Markov-perfect equilibria (MPEs), and would apply equally if we focus on subgame-perfect equilibria (SPEs), where strategies must be best responses to each other given all histories (and there is no restriction to Markovian strategies). Acemoglu (2006) establishes the following result:

[11] This result is similar to that in Acemoglu and Robinson (2006b), where a ruling elite may want to block beneficial technological change in order to increase the probability of political survival.

Proposition 5. *The MPEs characterized in Propositions 1–4 are the unique SPEs.*

Intuitively, since each producer is infinitesimal (thus price-taker in the economic transactions), they always choose their factor demands according to equations (5) and (6), and thus it is not possible to construct SPEs that are not Markovian.

Lack of Commitment—Holdup

The models discussed so far featured full commitment to taxes by the elites. Using a term from organizational economics, this corresponds to the situation without any "*holdup*". Holdup (lack of commitment to taxes or policies) changes the qualitative implications of the model; if expropriation (or taxation) happens after investments, revenues generated by investments can be *ex post* captured by others. These types of holdup problems are likely to arise when the key investments are *long-term*, so that various policies will be determined and implemented after these investments are made (and sunk).

The problem with holdup is that the elite will be unable to commit to a particular tax rate before middle-class producers undertake their investments (taxes will be set after investments). This lack of commitment will generally increase the amount of taxation and inefficiency. To illustrate this possibility, I consider the same model as above, but change the timing of events such that, first, individual producers undertake their investments and then the elite set taxes. The economic equilibrium is unchanged, and, in particular, (5) and (6) still determine factor demands, with the only difference that τ^m and τ^e now refer to "expected" taxes. Naturally, in equilibrium expected and actual taxes coincide.

What is different is the calculus of the elite in setting taxes. Previously, they took into account that higher taxes would discourage investment. Since, now, taxes are set after investment decisions, this effect is absent. As a result, in the MPE, the elite will always want to tax at the maximum rate, so in all cases there is a unique MPE where $\tau_t^m = \tau^{HP} \equiv \bar{\tau}$ for all t. This establishes (proof in the text):

Proposition 6. *With holdup, there is a unique political equilibrium with* $\tau_t^m = \tau^{HP} \equiv \bar{\tau}$ *for all* t.

It is clear that this holdup equilibrium is more inefficient than the equilibria characterized above. For example, imagine a situation in which condition (ES) holds so that with the original timing of events (without holdup), the equilibrium tax rate is $\tau_t^m = \alpha$. Consider the extreme case where $\bar{\tau} = 1$. Now without holdup, $\tau_t^m = \alpha$ and there is positive economic activity by the middle-class producers. In contrast, with holdup, the equilibrium tax is $\tau_t^m = 1$ and the middle class stop producing. This is naturally very costly for the elite as well since they lose all their tax revenues.

In this model, it is no longer true that the MPE is the only SPE, since there is room for an implicit agreement between different groups whereby the elite (credibly) promise a different tax rate than $\bar{\tau}$. To illustrate this, consider the example where condition (ES) holds and $\bar{\tau} = 1$. Recall that the history of the game is the complete set of actions taken up to that point. In the MPE, the elite raise no tax revenue from the middle-class producers. Instead, consider the following trigger–strategy combination: the elite always set $\tau^m = \alpha$ and the middle-class producers invest according to (5) with $\tau^m = \alpha$ as long as the history consists of $\tau^m = \alpha$ and investments have been consistent with (5). If there is any other action in the history, the elite set $\tau^m = 1$ and the middle-class producers invest zero; see Acemoglu (2006) for details. With this strategy profile, the elite raise a tax revenue of $\phi\alpha(1-\alpha)^{(1-\alpha)/\alpha} A^m \lambda \theta^m/(1-\alpha)$ in every period, and receive transfers worth

$$\frac{\phi}{(1-\beta)(1-\alpha)}\alpha(1-\alpha)^{(1-\alpha)/\alpha} A^m \lambda \theta^m. \tag{19}$$

If, in contrast, they deviate at any point, the most profitable deviation for them is to set $\tau^m = 1$, and they will raise

$$\frac{\phi}{1-\alpha}(1-\alpha)^{(1-\alpha)/\alpha} A^m \lambda \theta^m. \tag{20}$$

The trigger–strategy profile will be an equilibrium as long as (19) is greater than or equal to (20), which requires $\beta \geq 1 - \alpha$. Therefore we have (see Acemoglu, 2006):

Proposition 7. *Consider the holdup game, and suppose that assumption (A1) and condition (ES) hold and* $\bar{\tau} = 1$. *Then for* $\beta \geq 1 - \alpha$, *there exists a subgame-perfect equilibrium where* $\tau_t^m = \alpha$ *for all* t.

An important implication of this result is that in societies where there are greater holdup problems (for example, because typical investments involve longer horizons) there is room for coordinating on a subgame-perfect equilibrium supported by an implicit agreement (trigger–strategy profile) between the elite and the rest of the society.

Technology Adoption and Holdup

Suppose now that taxes are set before investments, so the source of holdup in the previous subsection is absent. Instead, suppose that at time $t = 0$ before any economic decisions or policy choices are made, middle-class agents can invest to increase their productivity. In particular, suppose that there is a cost $\Gamma(A^m)$ of investing in productivity A^m. The function Γ is nonnegative, continuously differentiable and convex. This investment is made once and the resulting productivity A^m applies forever after. The fact that technology choices are made once, or at any rate, more infrequently, partly distinguishes them from the investments in k, which are made in every period.

Once investments in technology are made, the game proceeds as before. Since investments in technology are sunk after date $t = 0$, the equilibrium allocations are the same as in Propositions 2–5 above. Another interesting question is whether, if they could, the elite would prefer to commit to a tax rate sequence at time $t = 0$.

The analysis of this case follows closely that of the baseline model (proofs omitted to save space):

Proposition 8. *Consider the game with technology adoption and suppose that assumption (A1) holds, condition (ES) does not hold, and* $\phi = 0$, *then the unique political equilibrium features* $\tau_t^m = \tau^{FPM} \equiv \bar{\tau}$ *for all t. Moreover, if the elite could commit to a tax sequence at time* $t = 0$, *then they would still choose* $\tau_t^m = \tau^{FPM} \equiv \bar{\tau}$.

That this is the unique MPE is quite straightforward. It is also intuitive that it is the unique SPE. In fact, the elite would choose exactly this tax rate even if they could commit at time $t = 0$. The reason is as follows: in the case of pure factor price manipulation, the only objective of the elite is to reduce the middle class's labor demand, so they have no interest in increasing the productivity of middle-class producers.

For contrast, let us next consider the pure revenue extraction case with condition (ES) satisfied. Once again, the MPE is identical to before. As a result, the first-order condition for an interior solution to the middle-class producers' technology choice is:

$$\Gamma'(A^m) = \frac{1}{1-\beta}\frac{\alpha}{1-\alpha}(1-\tau^m)^{1/\alpha}, \tag{21}$$

where τ^m is the constant tax rate that they will face in all future periods. In the pure revenue extraction case, recall that the equilibrium is $\tau^m = \tau^{RE} \equiv \min\{\alpha, \bar{\tau}\}$. With the same arguments as before, this is also the unique SPE. Once the middle-class producers have made their technology decisions, there is no history-dependent action left, and it is impossible to create history-dependent punishment strategies to support a tax rate different than the static optimum for the elite.[12] Nevertheless, this is not necessarily

[12] The fact that each middle-class producer is infinitesimal is once again important here. Otherwise, it would be possible to create a strategy profile where middle-class producers would collectively deviate from (5).

the allocation that the elite prefer. If the elite could commit to a tax rate sequence at time $t = 0$, they would choose lower taxes. To illustrate this, suppose that they can commit to a constant tax rate (it is straightforward to show that they will in fact choose a constant tax rate even without this restriction, but this restriction saves on notation). Therefore, the optimization problem of the elite is to maximize tax revenues taking the relationship between taxes and technology as in (21) as given. In other words, they will solve: max $\phi\tau^m(1-\tau^m)^{(1-\alpha)/\alpha}A^m\lambda\theta^m/(1-\alpha)$ subject to (21). The constraint (21) incorporates the fact that (expected) taxes affect technology choice.

The first-order condition for an interior solution can be expressed as

$$A^m - \frac{1-\alpha}{\alpha}\frac{\tau^m}{1-\tau^m}A^m + \tau^m\frac{dA^m}{d\tau^m} = 0,$$

where $dA^m/d\tau^m$ takes into account the effect of future taxes on technology choice at time $t = 0$. This expression can be obtained from (21) as:

$$\frac{dA^m}{d\tau^m} = -\frac{1}{1-\beta}\frac{1}{1-\alpha}\frac{(1-\tau^m)^{(1-\alpha)/\alpha}}{\Gamma''(A^m)} < 0.$$

This implies that the solution to this maximization problem satisfies $\tau^m = \tau^{TA} < \tau^{RE} \equiv \min\{\alpha, \bar{\tau}\}$. If they could, the elite would like to commit to a lower tax rate in the future in order to encourage the middle-class producers to undertake technological improvements. Their inability to commit to such a tax policy leads to greater inefficiency than in the case without technology adoption. Summarizing this discussion (proof in the text):

Proposition 9. *Consider the game with technology adoption, and suppose that assumption (A1) and condition (ES) hold and* $\phi > 0$, *then the unique political equilibrium features* $\tau_t^m = \tau^{RE} \equiv \min\{\alpha, \bar{\tau}\}$ *for all t. If the elite could commit to a tax policy at time* $t = 0$, *they would prefer to commit to* $\tau^{TA} < \tau^{RE}$.

An important feature is that in contrast to the pure holdup problem where SPE could prevent the additional inefficiency (when $\beta \geq 1-\alpha$, recall Proposition 7), with the technology adoption game, the inefficiency survives the SPE. The reason is that, since middle-class producers invest only once at the beginning, there is no possibility of using history-dependent punishment strategies. This illustrates the limits of implicit agreements to keep tax rates low. Such agreements not only require a high discount factor ($\beta \geq 1-\alpha$), but also frequent investments by the middle class, so that there is a credible threat against the elite if they deviate from the promised policies. When such implicit agreements fail to prevent the most inefficient policies, there is greater need for economic institutions to play the role of placing limits on future policies.

IV. Inefficient Economic Institutions

The previous analysis shows how inefficient policies emerge out of the desire of the elite, which possesses political power, to redistribute resources towards themselves. I now discuss the implications of these mechanisms for inefficient institutions. Since the elite prefer to implement inefficient policies to transfer resources from the rest of society (the middle class and the workers) to themselves, they will also prefer inefficient economic institutions that enable and support these inefficient policies.

To illustrate the main economic interactions, I consider two prototypical economic institutions: (1) *Security of property rights*; there may be constitutional or other limits on the extent of redistributive taxation and/or other policies that reduce profitability of producers' investments. In terms of the model above, we can think of this as determining the level of $\bar{\tau}$ (though this reduced-form modeling leaves open the question of how such institutional constraints on policies are implemented and made credible in practice); (2) *Regulation of technology*, which concerns direct or indirect factors affecting the productivity of producers, in particular middle-class producers.

As pointed out in the introduction, the main role of institutions is to provide the framework for the determination of policies, and, consequently, preferences over institutions are derived from preferences over policies and economic allocations. Bearing this in mind, let us now discuss the determination of economic institutions in the model presented here. To simplify the discussion, for the rest of the analysis, and in particular, throughout this section, I focus on MPE.

Security of Property Rights

The environment is the same as in the previous section, with the only difference that at time $t = 0$, before any decisions are taken, the elite can reduce $\bar{\tau}$, say from $\bar{\tau}^H$ to some level in the interval $[0, \bar{\tau}^H]$, thus creating an upper bound on taxes and providing greater security of property rights to the middle class. The key question is whether the elite would like to do so, i.e., whether they prefer $\bar{\tau} = \bar{\tau}^H$ or $\bar{\tau} < \bar{\tau}^H$.

Proposition 10. *Without holdup and technology adoption, the elite prefer* $\bar{\tau} = \bar{\tau}^H$.

The proof of this result is immediate, since without holdup or technology adoption, putting further restrictions on the taxes can only reduce the elite's utility. This proposition implies that if economic institutions are decided by the elite (which is the natural benchmark since they are the group with political power), they will in general choose not to provide additional security of property rights to other producers. Therefore, the underlying economic institutions will support the inefficient policies discussed above.

The results are different when there are holdup concerns. To illustrate this, suppose that the timing of taxation decision is after the investment decisions (so that there is the holdup problem), and consider the case with revenue extraction and factor price manipulation combined. In this case, the elite would like to commit to a lower tax rate than $\bar{\tau}^H$ in order to encourage the middle class to undertake greater investments, and this creates a useful role for economic institutions (to limit future taxes):

Proposition 11. *Consider the game with holdup and suppose assumptions (A1), (A2) and (A3) hold, condition (ES) does not hold, and* $\phi > 0$, *then as long as* τ^{COM} *given by (16) is less than* $\bar{\tau}^H$*, the elite prefer* $\bar{\tau} = \tau^{COM}$.

The proof is again immediate. Recall that τ^{COM} is the tax rate that maximizes the elite's utility, and this is the tax rate they would like to set. However, in the presence of holdup the MPE involves $\tau = \bar{\tau}^H$, and the elite can benefit by using economic institutions to manipulate equilibrium taxes.

This result shows that the elite may provide additional property rights protection to producers in the presence of holdup problems. The reason is that because of holdup, equilibrium taxes are too high even relative to those that the elite would prefer. By manipulating economic institutions, the elite may approach their desired policy (in fact, given the assumptions here, it can exactly commit to the tax rate that maximizes their utility).

Finally, for similar reasons, in the economy with technology adoption discussed above, the elite will again prefer to change economic institutions to restrict future taxes:

Proposition 12. *Consider the game with holdup and technology adoption, and suppose that assumption (A1) and condition (ES) hold and* $\phi > 0$, *then as long as* $\tau^{TA} < \bar{\tau}^H$*, the elite prefer* $\bar{\tau} = \tau^{TA}$.

As before, when we look at SPE, with pure holdup, there may not be a need for changing economic institutions, since credible implicit promises might play the same role (as long as $\beta \geq 1 - \alpha$, as shown in Proposition 7). However, parallel to the results above, in the technology adoption game, SPE and MPE coincide, so a change in economic institutions is necessary for a credible commitment to a low tax rate (here τ^{TA}).

Regulation of Technology

Economic institutions may also affect the environment for technology adoption or more directly the technology choices of producers. For example, by providing infrastructure or protection of intellectual property rights, a society may improve the technology available to its producers. Conversely, the elite may want to *block*, i.e., take active actions against, the technological improvements of the middle class.[13] Therefore the question is: do the elite have an interest in increasing the productivity of the middle class as much as possible?

Consider the baseline model. Suppose that there exists a government policy $g \in \{0, 1\}$, which influences only the productivity of middle-class producers, i.e., $A^m = A^m(g)$, with $A^m(1) > A^m(0)$. Assume that the choice of g is made at $t = 0$ before any other decisions, and has no other influence on payoffs (and, in particular, it imposes no costs on the elite). Will the elite always choose $g = 1$, increasing the middle-class producers' productivity, or will they try to block technology adoption by the middle class?

When the only mechanism at work is revenue extraction, the answer is that the elite would like the middle class to have the best technology:

Proposition 13. *Suppose assumption (A1) and condition (ES) hold and* $\phi > 0$, *then* $w = 0$ *and the elite always choose* $g = 1$.

The proof follows immediately since $g = 1$ increases the tax revenues and has no other effect on the elite's consumption. Consequently, in this case, the elite would like the producers to be as productive as possible, so that they generate greater tax revenues. Intuitively, there is no competition between the elite and the middle class (either in factor markets or in the political arena), and when the middle class is more productive, the elite generate greater tax revenues.

The situation is different when the elite wish to manipulate factor prices or wish to preserve their political power:

Proposition 14. *Suppose assumption (A1) holds, condition (ES) does not hold,* $\phi = 0$, *and* $\bar{\tau} < 1$, *then the elite choose* $g = 0$. *Alternatively, consider the economy with political replacement and suppose that assumption (A1) and condition (ES) hold and that* $\phi = 0$, *then the elite again prefer* $g = 0$.

Once again the proof of this proposition is straightforward. For example, with $\bar{\tau} < 1$, labor demand from the middle class is high enough to generate positive equilibrium wages. Since $\phi = 0$, taxes raise no revenues for the

[13] The decision to "block" technology adoption may also be considered a "policy" rather than an "economic institution". The reason why it may be closer to economic institutions is that it influences the set of options available to economic agents, and is plausibly slower to change than certain fiscal policies, such as taxes or government spending. See Acemoglu and Robinson (2006b) for a more detailed discussion of the elite's incentives to block technology.

elite, and their only objective is to reduce the labor demand from the middle class and wages as much as possible. This makes $g = 0$ the preferred policy for the elite. Similarly, when there is the risk of political replacement, the elite would like to set $g = 0$ in order to reduce the political threat from the middle class.

This proposition therefore shows that the factor price manipulation and political consolidation mechanisms induce the elite to choose economic institutions that reduce the productivity of competing (middle-class) producers.

Overall, this section has demonstrated how the elite's preferences over policies, and in particular their desire to set inefficient policies, translate into preferences over inefficient—non-growth-enhancing—economic institutions. When there are no holdup problems, introducing economic institutions that limit taxation or put other constraints on policies provides no benefits to the elite. However, when the elite are unable to commit to future taxes (because of holdup problems), equilibrium taxes may be too high even from the viewpoint of the elite, and in this case using economic institutions to manipulate future taxes may be beneficial. Similarly, the analysis reveals that when the factor price manipulation and political consolidation mechanisms are important, the elite may want to use economic institutions to discourage productivity improvements by the middle class, though this never happens when the main mechanism leading to inefficient policies is revenue extraction.

V. Inefficient Political Institutions

The above analysis characterized the equilibrium under "the dictatorship of the elite", i.e., a set of political institutions that gave all political power to the elite producers. An alternative is to have "the dictatorship of the middle class"—a system in which the middle class makes the key policy decisions (this could also be a democratic regime, where the middle class are the decisive voters). Finally, another possibility is democracy in which there is voting over different policy combinations. If $\theta^e + \theta^m < 1$, then in democracy the majority are the workers, and they will pursue policies to maximize their own income.[14]

Dictatorship of the Middle Class

With the dictatorship of the middle class, the political equilibrium is identical to the dictatorship of the elite, with the roles reversed. To avoid

[14] More generally, we could consider various different political institutions as represented by social welfare functions giving different weights to the elite, the middle class and the workers (see, for example, the Appendix to Chapter 4 in Acemoglu and Robinson, 2006a).

repetition, I will not provide a full analysis. Instead, let me focus on the case, combining revenue extraction and factor price manipulation. The analogues of assumptions (A2) and (A3) are:

$$A^m > (1 - \bar{\tau})^{1/\alpha} A^e \quad \text{and} \quad A^m \geq \phi(1-\alpha)^{(1-\alpha)/\alpha} A^e \frac{\theta^e}{\theta^m}. \tag{A4}$$

Given this assumption, a similar proposition to that above immediately follows; the middle class will tax the elite and will redistribute the proceeds to themselves, i.e., $T_t^w = T_t^e = 0$, and, moreover, the same analysis as above gives their most preferred tax rate as

$$\tau_t^e = \tilde{\tau}^{COM} \equiv \min\left\{\frac{\kappa(\lambda, \theta^m, \alpha, \phi)}{1 + \kappa(\lambda, \theta^m, \alpha, \phi)}, \bar{\tau}\right\}. \tag{22}$$

Proposition 15. *Suppose assumptions (A1) and (A4) hold, condition (ES) does not hold, and* $\phi > 0$, *then the unique political equilibrium with middle-class control features* $\tau_t^e = \tilde{\tau}^{COM}$ *as given by (22) for all* t.

Comparing this equilibrium to the equilibrium under the dictatorship of the elite, it is apparent that the elite equilibrium will be more efficient when A^e and θ^e are large relative to A^m and θ^m, and the middle-class equilibrium will be more efficient when the opposite is the case.

Proposition 16. *Suppose assumptions (A1) to (A4) hold, then aggregate output is higher with the dictatorship of the elite than the dictatorship of the middle class if* $A^e > A^m$ *and it is higher under the dictatorship of the middle class if* $A^m > A^e$.

Intuitively, the group in power imposes taxes on the other group (and since $\theta^m = \theta^e$, these taxes are equal) and not on themselves, so aggregate output is higher when the group with greater productivity is in power and is spared from distortionary taxation. This proposition is important, since it illustrates that whether a given set of political institutions (thus distribution of political power) is "efficient" or "inefficient"—from the viewpoint of increasing output—depends on the relative productivity of different groups. Elite control can be better for economic performance than middle-class control when the elite are relatively more productive.

Democracy

Let us now turn to a democratic regime where decisions are made by majoritarian voting, and assume that

$$\theta^m = \theta^e < \tfrac{1}{2}, \tag{A5}$$

so that workers are in the majority, so democratic decision-making will reflect their preferences. In particular, workers will now have the power to tax the elite and the middle class to redistribute themselves. More specifically, each worker's consumption is $c_t^w = w_t + T_t^w$, with w_t given by (7), so that workers care about equilibrium wages and transfers. Workers will then choose the sequence of policies $\{\tau_t^e, \tau_t^m, T_t^w, T_t^m, T_t^e\}_{t=0,1,\ldots,\infty}$ that satisfy (3) to maximize $\sum_{t=0}^{\infty} \beta^t c_t^w$.

It is straightforward to see that the workers will always set $T_t^m = T_t^e = 0$. Substituting for the transfers from (3), we obtain that democracy will solve the following maximization problem to determine policies:

$$\max_{\tau_t^e, \tau_t^m} w_t + \frac{\phi}{1-\alpha}\Big[\tau_t^m\big(1-\tau_t^m\big)^{(1-\alpha)/\alpha} A^m l^m \theta^m + \tau_t^e\big(1-\tau_t^e\big)^{(1-\alpha)/\alpha} A^e l^e \theta^e\Big] + R,$$

with w_t given by (7).

As before, when condition (ES) holds, taxes have no effect on wages, so the workers will tax at the revenue-maximizing rate, similar to the case of revenue extraction for the elite above. This result is stated in the next proposition (proof omitted):

Proposition 17. *Suppose assumption (A1) and condition (ES) hold and* $\phi > 0$, *then the unique political equilibrium with democracy features* $\tau_t^m = \tau_t^e = \tau^{RE} \equiv \min\{\alpha, \bar{\tau}\}$.

Therefore, in this case democracy is more inefficient than both middle-class and elite control, since it imposes taxes on both groups.[15] The same is not the case, however, when condition (ES) does not hold and wages are positive. In this case, workers realize that by taxing the marginal group they are reducing their own wages. In fact, taxes always reduce wages more than the revenue they generate because of their distortionary effects.[16] As a result, workers will only tax the group with the higher marginal productivity. More specifically, for example, if $A^m > A^e$, we will have $\tau_t^e = 0$, and τ_t^m will be such that $(1-\tau_t^m)^{1/\alpha} A^m = A^e$ or $\tau_t^m = \alpha$ and $(1-\alpha)^{1/\alpha} A^m \geq A^e$. Therefore, we have:

[15] Naturally, in this case we may expect workers to ultimately become entrepreneurs, and this extreme inefficiency to be ameliorated. See Acemoglu (2003).

[16] To see this, suppose there is only one group with productivity A. With a tax rate of τ, the wage is $\alpha(1-\tau)^{1/\alpha} A/(1-\alpha)$, and there is a per-worker transfer equal to $\phi\tau(1-\tau)^{(1-\alpha)/\alpha} A/(1-\alpha) + R$, so the total consumption of a worker is $\tilde{c}_t^w = (1-\tau)^{(1-\alpha)/\alpha} A[\alpha(1-\tau) + \phi\tau]/(1-\alpha) + R$. The derivative of this expression with respect to τ is $-(1-\tau)^{(1-2\alpha)/\alpha} A[(\phi-\alpha)\tau/\alpha - (1-\phi)]/(1-\alpha)$, which is always negative, implying that $\tilde{c}_t^w$ is maximized at $\tau = 0$.

Proposition 18. *Suppose assumptions (A1) and (A5) hold and condition (ES) does not hold. Then in the unique political equilibrium with democracy, if* $A^m > A^e$, *we will have* $\tau_t^e = 0$, *and* $\tau_t^m = \tau^{Dm}$ *will be such that* $(1 - \tau^{Dm})^{1/\alpha} A^m = A^e$ *or* $\tau^{Dm} = \alpha$ *and* $(1-\alpha)^{1/\alpha} A^m \geq A^e$. *If* $A^m < A^e$, *we will have* $\tau_t^m = 0$, *and* $\tau_t^e = \tau^{De}$ *will be such that* $(1 - \tau^{De})^{1/\alpha} A^e = A^m$ *or* $\tau^{De} = \alpha$ *and* $(1-\alpha)^{1/\alpha} A^e \geq A^e$.

Proof: Most of the proof of this proposition follows directly from the analysis so far. The only part that is not obvious is that workers prefer to set zero taxes on the less productive group. To prove this result, without loss of generality, focus on the case where $A^m > A^e$ and denote $\theta^m = \theta^e = \theta$. First, note that workers can adopt two different strategies: either choose a policy vector such that $(1-\tau^m)^{1/\alpha} A^m \geq (1-\tau^e)^{1/\alpha} A^e$ or such that $(1-\tau^m)^{1/\alpha} A^m \leq (1-\tau^e)^{1/\alpha} A^e$. In the first case, the elite producers have lower net productivity and thus the equilibrium wage is $w_t = \alpha(1-\tau^e)^{1/\alpha} A^e/(1-\alpha)$, while in the second is $w_t = \alpha(1-\tau^m)^{1/\alpha} A^m/(1-\alpha)$. The payoffs to the workers from the two strategies are:

$$W^1(\tau^m, \tau^e) = \frac{\alpha}{1-\alpha}(1-\tau^e)^{1/\alpha} A^e + \frac{\phi}{1-\alpha}\tau^e (1-\tau^e)^{(1-\alpha)/\alpha} A^e (1-\lambda\theta) + \frac{\phi}{1-\alpha}\tau^m (1-\tau^m)^{(1-\alpha)/\alpha} A^m \lambda\theta \tag{23}$$

and

$$W^2(\tau^m, \tau^e) = \frac{\alpha}{1-\alpha}(1-\tau^m)^{1/\alpha} A^m + \frac{\phi}{1-\alpha}\tau^e (1-\tau^e)^{(1-\alpha)/\alpha} A^e \lambda\theta + \frac{\phi}{1-\alpha}\tau^m (1-\tau^m)^{(1-\alpha)/\alpha} A^m (1-\lambda\theta), \tag{24}$$

which incorporate the fact that the more productive group will employ $\lambda\theta$ workers, while the less productive group will employ the remainder, $1-\lambda\theta$ workers. The result can now be proved in two steps.

Step 1. First we can see that the first strategy is preferred. For this, it is sufficient to show that $\max_{\tau^m,\tau^e} W^1(\tau^m, \tau^e) \geq \max_{\tau^m,\tau^e} W^2(\tau^m, \tau^e)$. To obtain a contradiction, suppose this is not the case. This implies that there exists $(\tilde{\tau}^m, \tilde{\tau}^e) \in \arg\max_{\tau^m,\tau^e} W^2(\tau^m, \tau^e)$ subject to $(1-\tau^m)^{1/\alpha} A^m \leq (1-\tau^e)^{1/\alpha} A^e$ and $W^2(\tilde{\tau}^m, \tilde{\tau}^e) \geq W^1(\tau^m, \tau^e)$ for all (τ^m, τ^e) that satisfy $(1-\tau^m)^{1/\alpha} A^m \geq (1-\tau^e)^{1/\alpha} A^e$. Consider two cases. First, the constraint on the problem $\max_{\tau^m,\tau^e} W^2(\tau^m, \tau^e)$ is slack, so that $(1-\tilde{\tau}^m)^{1/\alpha} A^m < (1-\tilde{\tau}^e)^{1/\alpha} A^e$. But in this case, the derivative of (24) with respect to τ^m is

$$-\frac{1}{1-\alpha}(1-\tau^m)^{(1-2\alpha)/\alpha} A^m \left\{ \frac{\phi\lambda\theta - \alpha}{\phi\lambda\theta}\tau^m + (1-\phi\lambda\theta) \right\},$$

which is negative for all τ^m, implying that the optimal tax rate on middle-class producers in this case is $\tau^m = 0$. This combined with $A^m > A^e$ contradicts $(1-\tilde{\tau}^m)^{1/\alpha}A^m \le (1-\tilde{\tau}^e)^{1/\alpha}A^e$. Therefore, we must have the constraint tight, i.e., $(1-\tilde{\tau}^m)^{1/\alpha}A^m = (1-\tilde{\tau}^e)^{1/\alpha}A^e$. Then suppose that $(1-\tilde{\tau}^m)^{1/\alpha}A^m = (1-\tilde{\tau}^e)^{1/\alpha}A^e$, and consider the policy vector $(\tilde{\tau}^m, \tilde{\tau}^e - \varepsilon)$, which clearly satisfies the constraint $(1-\tau^m)^{1/\alpha}A^m \ge (1-\tau^e)^{1/\alpha}A^e$, and thus corresponds to the first strategy. Then substituting for the relationship $(1-\tilde{\tau}^m)^{1/\alpha}A^m = (1-\tilde{\tau}^e)^{1/\alpha}A^e$ in (23) and (24), we have:

$$\begin{aligned} W^1(\tilde{\tau}^m, \tilde{\tau}^e - \varepsilon) = {} & \frac{\alpha}{1-\alpha}(1-\tilde{\tau}^e-\varepsilon)^{1/\alpha}A^e \\ & + \frac{\phi}{1-\alpha}\frac{\tilde{\tau}^e-\varepsilon}{1-\tilde{\tau}^e+\varepsilon}(1-\tilde{\tau}^e-\varepsilon)^{1/\alpha}A^e(1-\lambda\theta) \\ & + \frac{\phi}{1-\alpha}\frac{\tilde{\tau}^m}{1-\tilde{\tau}^m}(1-\tilde{\tau}^e)^{1/\alpha}A^e\lambda\theta \end{aligned}$$

and

$$\begin{aligned} W^2(\tilde{\tau}^m, \tilde{\tau}^e) = {} & \frac{\alpha}{1-\alpha}(1-\tilde{\tau}^e)^{1/\alpha}A^e + \frac{\phi}{1-\alpha}\frac{\tilde{\tau}^e}{(1-\tilde{\tau}^e)}(1-\tilde{\tau}^e)^{1/\alpha}A^e\lambda\theta \\ & + \frac{\phi}{1-\alpha}\frac{\tilde{\tau}^m}{(1-\tilde{\tau}^m)}(1-\tilde{\tau}^e)^{1/\alpha}A^e(1-\lambda\theta). \end{aligned}$$

Since $A^m > A^e$, it must be that $\tilde{\tau}^m > \tilde{\tau}^e$. Using the fact that $\lambda\theta > 1-\lambda\theta$, as $\varepsilon \to 0$, $W^1(\tilde{\tau}^m, \tilde{\tau}^e - \varepsilon) > W^2(\tilde{\tau}^m, \tilde{\tau}^e)$, which leads to a contradiction, establishing Step 1.

Step 2. It is now sufficient to establish that $\tau^e = 0$. Given the result in Step 1, the problem of the workers is to maximize

$$\begin{aligned} W^1(\tau^m, \tau^e) = {} & \frac{\alpha}{1-\alpha}(1-\tau^e)^{1/\alpha}A^e \\ & + \frac{\phi}{1-\alpha}\tau^e(1-\tau^e)^{(1-\alpha)/\alpha}A^e(1-\lambda\theta) \\ & + \frac{\phi}{1-\alpha}\tau^m(1-\tau^m)^{(1-\alpha)/\alpha}A^m\lambda\theta, \end{aligned}$$

subject to

$$(1-\tau^m)^{1/\alpha}A^m \ge A^e(1-\tau^e)^{1/\alpha}.$$

If the constraint is slack, the first-order condition with respect to τ^e is

$$-\frac{1}{1-\alpha}(1-\tau^e)^{(1-2\alpha)/\alpha}A^e\left\{\frac{\phi\lambda\theta-\alpha}{\phi\lambda\theta}\tau^e + (1-\phi\lambda\theta)\right\} \le 0 \quad \text{and} \quad \tau^e \ge 0,$$

with complementary slackness, which again yields $\tau^e = 0$, and hence $\tau^m = \alpha$, as claimed in the proposition. If the constraint is tight, then substituting for it, we obtain

$$W^1(\tau^e) = \frac{1}{1-\alpha}(1-\tau^e)^{(1-\alpha)/\alpha} A^e \Bigg\{ \alpha(1-\tau^e) + \phi\tau^e + \phi\lambda\theta\left(\left(\frac{A^m}{A^e}\right)^\alpha - 1\right)\Bigg\}.$$

The first-order condition for the maximization of this expression is

$$-\frac{1}{1-\alpha}(1-\tau^e)^{(1-2\alpha)/\alpha} A^e \left\{ \frac{\phi-\alpha}{\phi}\tau^e + (1-\phi) \right\} \leq 0,$$

which again implies $\tau^e = 0$. This establishes the claim in Step 2, and completes the proof of the proposition. ■

This result implies that because, without excess supply of labor, wages are determined by the marginal productivity of the less productive of the two entrepreneurial groups, democracy will impose relatively low taxes (in particular, zero taxes on the less productive group and sufficiently low taxes on the other). Consequently, in the presence of excess labor supply, democracy taxes both groups of producers and generates even more inefficiency than the dictatorship of the elite or the middle class, but in contrast, when there is no excess supply, it is in general less distortionary than the dictatorship of the middle class or the elite. The intuition is that when without excess supply for labor, workers understand that high taxes will depress wages and are therefore less willing to use distortionary taxes.[17]

Inappropriate Institutions

The above analysis poses the question of whether a given set of economic institutions might be "appropriate" for a while, but then become "inappropriate" and costly for economic activity later. This question might be motivated, for example, by the contrast of the northeastern United States and the Caribbean colonies between the seventeenth and nineteenth centuries. The Caribbean colonies were clear examples of societies controlled by a narrow elite, with political power in the monopoly of plantation owners, and few rights for the slaves that made up the majority of the population.[18] In contrast, the northeastern United States developed as a settler colony, approximating a democratic society with significant political power in the hands of smallholders and a broader set of producers. While in both the seventeenth and eighteenth centuries, the Caribbean societies were among

[17] This is similar to the reasons why workers (democracy) are less in favor of entry barriers than oligarchic societies (see Acemoglu, 2003).
[18] See, for example, Beckford (1972) and Dunn (1972).

the richest places in the world, and almost certainly richer and more productive than the northeastern United States,[19] starting in the late eighteenth century, they lagged behind the United States and many other more democratic societies, which took advantage of new investment opportunities, particularly in industry and commerce.[20] This raises the question as to whether the same political and economic institutions that encouraged the planters to invest and generate high output in the seventeenth and early eighteenth centuries then became a barrier to further growth.

The baseline model used above suggests a simple explanation along these lines. Imagine an economy in which the elite are in power, condition (ES) does not hold, ϕ is small, A^e is relatively high and A^m is relatively small to start with. The above analysis shows that the elite will choose a high tax rate on the middle class. Nevertheless, output will be relatively high, because the elite will undertake the right investments themselves, and the distortion on the middle class will be relatively small since A^m is small.

Consequently, the dictatorship of the elite may generate greater income per capita than an alternative society under the dictatorship of the middle class. This is reminiscent of the planter elite controlling the economy in the Caribbean. However, if at some point the environment changes so that A^m increases substantially relative to A^e, the situation changes radically. The elite, still in power, will continue to impose high taxes on the middle class, but now these policies have become very costly because they distort the investments of the more productive group. Another society where the middle class have political power will now generate significantly greater output.

This simple example illustrates how institutions that were initially "appropriate" (i.e., that did not generate much distortion or may have even encouraged growth) later caused society to fall substantially behind other economies.

VI. Conclusions

This paper developed a simple framework to investigate why inefficient—non-growth-enhancing—institutions emerge and persist. Political institutions shape the allocation of political power. Economic institutions, in turn, determine the framework for policy-making and place constraints on policies. Groups with political power—the elite—choose policies in order to

[19] Although the wealth of the Caribbean undoubtedly owed much to the world value of its main produce, sugar, Caribbean societies were nonetheless able to achieve these levels of productivity because the planters had a good incentive to invest in the production, processing and export of sugar; see e.g. Eltis (1995).

[20] See, for example, Acemoglu, Johnson and Robinson (2002) and Engerman and Sokoloff (1997).

transfer resources from the rest of society to themselves. Consequently, they have *induced preferences* over institutions, depending on how institutions map into policies and economic outcomes. The paper illustrated how these induced preferences over (inefficient) economic institutions might be generated because of the revenue extraction, factor price manipulation or political consolidation reasons. It also highlighted the role of long-term investments and holdup issues.

Rather than repeating the main results, it may be more useful at this point to highlight a number of important areas for current and future research:

(1) Most importantly, the analysis here only considered voluntary institutional change, where the group in power may decide to restrict its own powers. Most political change in practice does not take this voluntary form. For example, even when the dictatorship of the elite is inefficient or becomes inappropriate, the elite may want to preserve the system as it is, while other groups will fight to induce regime change. A satisfactory model of "inefficient institutions" ought to incorporate equilibrium changes in political institutions. The framework in Acemoglu and Robinson (2006a) is a step in this direction; see the companion paper, Acemoglu (2006), for an application of similar ideas in the current setup. It endogenizes equilibrium political institutions (and their change and persistence) in a context of social conflict between groups and building on the role of political institutions in regulating the future distribution of *de jure* political power.

(2) While the model featured three distinct groups, it sidestepped issues of political coalitions. One of the most prominent areas for the theory of political economy is the analysis of coalitions between different social groups.

(3) The model presented here features only limited intertemporal interactions. Introducing capital accumulation (without full depreciation) is one important area of investigation. This will enable both an analysis of dynamic taxation and also of questions related to how inefficiencies change as the economy becomes richer.

(4) The class of models used for political economy also needs to be enriched by considering more realistic policies. Although taxes here stand for various different distortionary redistributive policies, explicitly allowing for these policies is likely to lead to new and richer results. Most importantly, such a generalization will allow a discussion of the "optimal" and equilibrium mix of policies in the context of political economic interactions.

(5) In the model, government policy is purely redistributive. Another important area of investigation is the interaction of the rent-seeking and efficiency-enhancing roles of governments.

(6) Finally, the discussion of inappropriate institutions also raised questions related to institutional flexibility. An important question is whether a given set of institutions are flexible, i.e., capable of changing rapidly in the face of changes in the environment. Which features make institutions flexible and whether institutional flexibility matters for economic performance are also interesting areas for future research.

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