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Why are the transition paths in China and Eastern Europe different?

A political economy perspective[1]

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Abstract

The purpose of this paper is to provide a framework linking communist regime collapse and privatizing economic reforms. The framework permits us to explain why certain communist regimes lost their monopoly of political power while others have not. We show that the essential difference between those communist regimes which survived economic reform and those which did not, lies in the nature of the privatization reform introduced by the communist leadership. The privatization that we call 'Market-Leninist', was implemented in China and Vietnam while the second type of privatization, termed 'Embezzlement for a rainy day' was the type of privatization implemented in Eastern Europe. We show, in the context of a game between rulers and the population, that the size of the repressive apparatus is the key element determining the type of privatization chosen by the rulers.

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1. Introduction

There has been a marked difference in the transition dynamics which have taken place over the past decade between Eastern Europe on one hand, and China and Vietnam on the other. The latter countries have introduced successful market-oriented privatizing reforms in the presence of communist dictatorships which show no signs of weakening. In Eastern Europe, however, the collapse of communism went hand in hand with economic reforms.

The aim of this paper is to explain the difference in the transition paths by investigating the nature of the links between political changes and economic reform. We show that the decision taken by a government concerning the nature of economic reform is intimately related to the choice of political changes. In other words, we show that the essential difference between those communist regimes which survived economic reform and those which did not, lies in the nature of the privatization reform introduced by the communist leadership.

We consider two conceptually very different kinds of privatization: 'embezzlement for a rainy day' and 'Market-Leninism'.[2] The first involves privatizing the state sector fraudulently. The rulers essentially write out, for themselves, title deeds to state property. This type of reform includes not only the so-called 'spontaneous privatization', but also sales to outside owners or even foreigners, from which the rulers obtain substantial pecuniary benefits from the transaction. This type of privatization was performed by Eastern European countries.

The second type of reform, 'Market-Leninism', involves leaving the state sector unchanged but permitting members of society to engage in private economic activity free from barriers to entry. This type of reform was chosen by China. From 1978 to 1991, the size of the private sector gradually increased from zero to 10 percent (see Qian and Xu, 1993).

However, the choice of privatization strategy is endogenous. In our framework, the factor that determines the choice of a privatization scheme under reforming communism is the probability of regime collapse. The latter is itself a function of the allocation of resources between economic agents and the means of repression. We show that the size of the repressive apparatus determines the type of privatization chosen by the rulers; with a sufficiently large repressive apparatus the leaders choose 'Market-Leninism', while with a smaller one, they opt for 'Embezzlement for a rainy day'.

'Embezzlement' is chosen by the rulers if the means of repression at their disposal are relatively low, and the probability of regime collapse is high. The purpose of this embezzlement is to ensure that, should the regime collapse, the communist rulers of today become the rich capitalists in tomorrow's democracy.

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[2] Although there is a literature which contrasts big-bang privatization with gradualism (see Qian *et al.*, 1999), our focus is slightly different and incorporates another typology.

The second option involves an economic reform, which permits the establishment of new private enterprises and requires a relatively high level of repression, so that the probability of continued communist dictatorship is high. There is no disruption of the state sector, but the creation of a private market alongside the state sector which leads to output growth. Being the holders of political power at the beginning of this process, the rulers also profit, as entrepreneurs, from the growth of the private sector. However, the cost of this policy is that, since part of the economy is now open to 'capitalism', the rulers lose their grip over the allocation of society's resources. The important element in this equilibrium is that the repressive apparatus is large. Thus, economic reform and political repression can be seen as mutually reinforcing. Kristof and Wudunn (1994) have coined the phrase 'Market-Leninism' to describe such a system.[3]

This relationship between repression, privatization and political changes may be used to explain why the path of privatization in China and Vietnam has been different than in Eastern Europe. It is due to the maintenance of a strong repressive apparatus in China, while in Eastern Europe, during the end of the 1980s, the repressive apparatus was far weaker, due to the disappearance of the Soviet Union as a provider of military intervention. In consequence, in the two cases the rulers chose different types of privatization.

In our framework, the rulers decide which type of privatization to undertake and simultaneously whether to maintain the communist regime or to replace it with a democracy and resign. If they resign, then there is democracy. However if they keep the communist regime, they also determine the allocation of output between themselves and the workers. The workers then decide whether or not to fight the regime, the outcome of such a struggle being uncertain. In this paper, we first show that when the means of repression are low, and the probability of losing the fight against the workers is high, then the best choice for the rulers is to choose privatization of the 'embezzlement' type and to resign. When the means of repression are high, the probability of losing power is low, and it is not worthwhile for the workers to revolt – Market-Leninism is then chosen. So the prediction of our model is that the size of the means of repression determines the possibility of regime change, as well as the type of privatization.

In the last section of the paper, we endogenize the determination of the optimal amount of output allocated to the means of repression, and show that under this optimal amount, it is preferable to choose the Market-Leninist privatization. Despite Market-Leninism being optimal, countries in Eastern Europe did not opt for this choice because insufficient resources did not allow them to choose the optimal level of repressive apparatus. This was because the Soviets withdrew means of repression which had hitherto been at the disposal of the regimes. Consequently, these regimes were forced to choose 'embezzlement'.

[3] That is, a system with 'allegiance to both market economics and Leninist political principles' (p. 431).

Our paper relates to two lines of literature, one that relates economic behaviour to political issues, and a second, which is concerned specifically with privatization. The relation between economic behaviour and political upheaval has been the subject of considerable research. Roemer (1985) pioneered the view of revolutions and insurrections as strategic games. Grossman (1991, 1996) analyses the allocation of labour between military activity and production. In his framework, as in ours, this allocation affects the probability of insurrection and the distribution of income. However, this literature does not relate these issues to privatization.

The literature on privatization, on the other hand, does not relate the issue to political structure. For the most part, the literature analyzes privatization from a purely economic viewpoint; for instance, the method and timing of privatization (see Bolton and Roland, 1992 and Lipton and Sachs, 1990), and the relationship between privatization and capital markets (see Blanchard *et al.*, 1994). Qian *et al.* (1999) examine the differences between privatization in China and Eastern Europe but their analysis is restricted to strictly economic considerations. They explain differences in methods of privatization as resulting from different forms of firm organization.

Our model also relates to the literature linking privatization and political upheavals (see Wintrobe, 1990; Schnytzer, 1994 and Ferrero, 1999). In our model, strategic behaviour on the part of both the population and the communist rulers is taken into account.

The paper is divided into five parts. In the next section we present the basic model that incorporates the differences between the two types of privatization. In Section 3 we present a comparison between the two types of privatization. In Section 4, we apply this model to the comparison between China and Eastern Europe. A conclusion is presented in Section 5.

2. The model

2.1 The general framework

Consider an economy in which the communist party has a monopoly of political power and the means of production are state owned. There are two players in the economy: rulers and workers. The rulers determine the distribution of output between workers and themselves. They pay the workers an amount necessary to ensure that they work. The rulers also allocate output to maintain a repressive apparatus in order to prevent the workers from attempting to overthrow the regime, which in this part is taken as exogenous. In our model, the larger the repressive apparatus, the lower the probability that workers succeed in revolution. The means of repression in communist countries include not only the regular police and secret police, but also parts of the army. Further, the specific organizations that constitute the means of repression differ from country to country, although for the purposes of this paper its precise composition is of no consequence.

2.1.1 Privatizing reforms[4]

The rulers in a communist regime decide to implement privatization and have the choice between two types of privatization: 'Embezzlement for a rainy day' and 'Market Leninism'.[5]

Embezzlement for a rainy day

A first possible means of privatization is just to sell all state property to the private market. It is accomplished by announcing a privatizing economic reform whereby state enterprises are permitted to 'buy themselves' at prices determined by negotiation. Enterprise managers, who are members of the ruling elite, restructure state enterprises so as to reduce their notional market value and then buy the enterprises at very low prices. This privatization is equivalent to giving the state property to the rulers, and amounts to the embezzlement of state property by the rulers, the custodians of state property. The benefit for the rulers is that in case of regime collapse, they do not lose everything but have the privatized assets. Therefore, the benefit of this type of privatization is that it provides the rulers with potential *insurance* against regime collapse.[6]

Privatization, as with any decision taken by the rulers, has consequences not only for the allocation of output but also for the level of output. In the modern transition literature, the relationship between privatization and output has produced two lines of reasoning. The first is that privatization reduces output since it causes macroeconomic disruption due to the end of central planning; the second is that output falls owing to the excessive diffusion of economic decision-making power.[7]

The effect of privatization on the level of output through a disruption in coordination has already been emphasized by the development literature on optimal planning (see Dobb, 1960). The economic basis of a communist regime is that the whole economy is under a planning system. The state controls most of the economy down to decisions at the firm level. Prices do not play any allocative role; it is

[4] We could, of course, ask why privatization suddenly is part of the bundle of choice and not before. This is not the purpose of this paper. In Brezis and Schnytzer (1998), it is shown that, if the rulers believe – for example, on account of increasing inefficiency in the planned economy – that the level of output is unlikely to be sufficient to sustain a stable regime, they may turn to economic reform. In this paper, we take as given that at some point privatization is under consideration and we consider which type of privatization is optimal.

[5] There are in fact many forms of privatization in the literature, but if we consider only those implemented by a communist nomenklatura in power, we are left with these two types of privatization. Either selling to itself or keeping state property and allowing new private firms. Recall that the nomenklatura is trying to maximize its utility, therefore if in power it will never choose to implement privatization by vouchers. This was done in Czechoslovakia, Russia and elsewhere after the loss of power. We therefore ignore this option and consider only the two types of privatization optimal for the nomenklatura.

[6] In reality some of the spontaneous privatizations were undertaken before resignation, and some were undertaken after loss of power. For simplicity, we assume simultaneity of decisions in our model.

[7] These two views on the relationship between privatization focus on the supply side only. There is also an opposite view, according to which the sharp decline in output is due more to demand than supply shocks (see Blanchard *et al.*, 1994).

the bureaucrats who decide what to produce, to whom to sell, how many people are employed and at what wages, and who take investment decisions and fix prices.

Privatization implies not only a change in decision-making power but also massive changes that lead to a disruption of established links within the economy (see Desai, 1997). Since part of the state sector is restructured there will be 'large dislocations in the distribution system, preventing inputs from going to firms or goods from getting to consumers' (Berg and Blanchard, 1994, p. 57). In other words, the reallocation of control rights 'disrupted the standard supply chains, since state firms could no longer count on deliveries from other state firms, which simply sold their product on the black market.' (Boycko *et al.*, 1995, pp. 39–40). This is also called 'the disorganization effect' (see Blanchard, 1997; Blanchard and Kremer, 1997; and Roland and Verdier, 1999). In these countries 'once the central planner disappears, the result can be a decrease in total production' (Blanchard, 1997, pp. 39–41).

A second effect of privatization on output occurred when 'the communist party lost its control rights and they were split between many agencies. As a result, firms faced continued pressure to pursue political objectives except now, more often that not, these objectives conflicted with each other. The split of political control among agencies with conflicting objectives after the collapse of the Communist party was probably as responsible for the economic decline during the transition from socialism to free markets as anything else.' (Boycko *et al.*, 1995, pp. 41–42).

These two views emphasize that the disruption of established links within an economy has a negative consequence for output. However, the disruption did not have to happen in all sectors to the same degree, and some sectors might be affected more than others. But overall, output is affected and we therefore assume in our model that the higher the number of firms privatized, the greater the extent of disruption.

Market-Leninism

The second type of privatization which can be implemented by the rulers is to keep as non-privatized the existing state sector but to allow members of the population to open private firms. This policy implies that there is no internal disruption of the state sector, but the parallel creation of a new privatized economy. State enterprises are not privatized; thus, the market operates in parallel with the state sector, and some workers receive their payoffs from working at state enterprises while others own privatized enterprises.

There is an essential difference between the two sectors which has recently been emphasized (see World Bank Policy Research, 1996; Nolan and Xiaoqiang, 1999). The sectors that are private show higher productivity. This has been explained essentially by greater competition as well as spillover effects between them (see Gelb and Singh, 1994). The higher the share of the free market, the more spillover or competition exists. The rulers receive the output which remains after paying workers and financing the repressive apparatus. Thus, this form of privatization

affects output positively but has two conflicting effects on the rulers' payoffs. On one hand, it leads to an increase in rents owing to an increase in output. On the other hand, part of the output now accrues to workers, independently of the rulers.

2.1.2 Output and privatization

We include in our definition of output, Y, all resources available including foreign transfers. As underlined above, output is a function of the type of privatization chosen. The embezzlement type of privatization will be denoted privatization 1 (and output Y_1), the Market-Leninist type being privatization 2 (and output Y_2).

In the case of privatization 1, as explained above, output is a negative function of the proportion of assets privatized. Therefore, we assume that:

$$Y_1 = Y(\gamma_1) \tag{1}$$

where $Y' < 0$ and γ_1 is the proportion of state assets privatized under 'embezzlement'.

In the case of privatization 2, The output in the economy is produced in two different sectors: the original state sector and the new market economy.
Thus we have:

$$Y_2 = Y(\gamma_2) = Y_s + Y_m \tag{2}$$

where Y_s is state sector output and Y_m is market output. We define γ_2 as the ratio of workers working in the free enterprise sector to the total number of workers, i.e., the proportion of privatization in the economy. The private sectors show higher productivity as mentioned above. For simplicity, in our model we will capture this effect by assuming that the productivity of workers in the state sector, A_s, is constant, and smaller than the productivity A_m, of workers in the private sector of the economy. Moreover, due to positive externalities arising from the size of the private sector, productivity, A_m, is a function of γ_2, and that $A_m' > 0$, and $A_m'' < 0$, i.e., the externalities are decreasing. Therefore:

$$Y(\gamma_2) = A_s L_s + A_m(\gamma_2) L_m, \text{ where } Y' > 0, \text{ and } Y'' < 0 \tag{3}$$

and

$$L_s = [1 - \gamma_2]L \text{ and } L_m = \gamma_2 L, \tag{4}$$

where L is the labour force normalized to 1. L_s and L_m are the workers in the state and private enterprises respectively.

Equation (3) may be rewritten:

$$Y_2 = A_s + \gamma_2[A_m(\gamma_2) - A_s] \tag{5}$$

To be consistent, we finally assume that the two privatization strategies start from the same initial point (i.e., $Y_1(0) = Y_2(0) = A_s$).

2.1.3 Allocation of output

The rulers determine the allocation of output, Y, among themselves, workers and the means of repression. We assume that the rulers cannot give workers less than some bundle that is the minimum necessary for subsistence, W_f. Moreover a fixed proportion of output, βY, is allocated to the means of repression, leaving the rulers with rents R:

$$R = [1 - \beta]Y - W \tag{6}$$

where W is the allocation of output to workers and $W \geq W_f$.

In the case of Market-Leninism, one has to describe the allocation of output between the two sectors. We assume that wages differ between the state and private sectors. Indeed there will inevitably be some barriers to entry, since not each worker will receive the right to engage in private enterprise (for example, well-known 'enemies' of the regime). The rulers determine the wages in the state sector, W_s. In private enterprise, workers receive their output (since there is only one factor of production). Note that some part of private output accrues to the rulers, since rulers also engage in private entrepreneurial activity. Thus, rulers receive a proportion $[1 - t(\gamma_2)]$ of the output of the private sector. We assume that this proportion falls as the size of the private sector increases, i.e., $1 \geq t \geq 0$, $t' > 0$, and $t'' > 0$.[8] In order to simplify the algebra, we premultiply t by a constant $(1 - \beta)$ so that the income earned by the workers in the private sector is:

$$W_m = A_m(1 - \beta)\, t(\gamma_2). \tag{7}$$

Thus, the allocations of output to workers and rulers respectively are:

$$W = W_s(1 - \gamma_2) + \gamma_2 W_m \tag{8}$$

and as in equation (6):

$$R = (1 - \beta)Y_2 - W. \tag{9}$$

2.1.4 Timing of decisions

There are two stages. First, the rulers have to take three decisions: (i) they decide whether to stay in power or to resign (thereby opting for democracy and an end to a communist monopoly of political power); (ii) they also decide on the type and

[8] As the major capital holders in the society, the rulers have an evident advantage in the private sector when it is first introduced. However, as the market grows the extent of this advantage decreases.

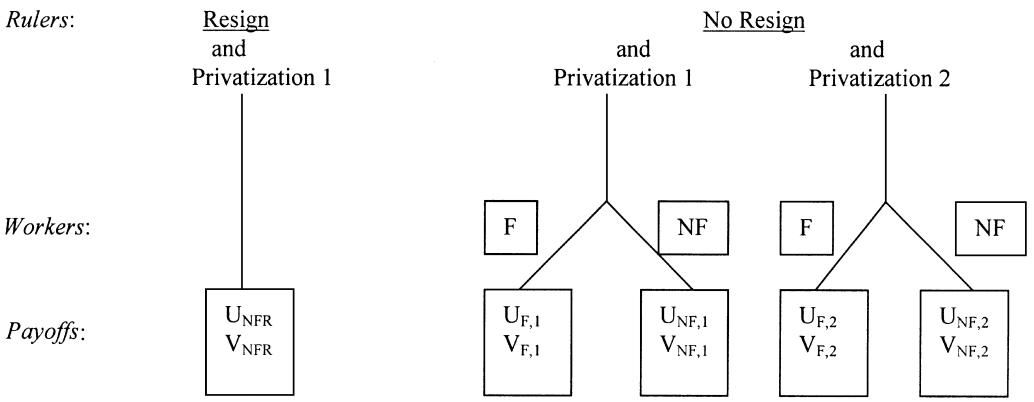
amount of privatization; furthermore, if they do not resign, (iii) they decide upon the distribution of output, i.e., they decide how much output to allocate to the workers. They also allocate output to the means of repression, but in this part, those are exogenously given.

In the second stage, workers, seeing the size of the repressive apparatus and their share of output, decide whether or not to fight the regime. Equilibrium in the model is, therefore, the outcome of a Stackelberg game.

2.1.5 Payoffs in the second stage of the game

There are three possible sets of payoffs. The first set follows the rulers' decision to give up political power. We define the payoffs to rulers and workers in this case as, respectively: U_{NFR} and V_{NFR} (the subscript NFR denotes no-fight and resign). The second arises when rulers choose to remain in power but workers fight, the payoffs to rulers and workers respectively being U_F and V_F (the subscript F is fight). The third set arises when rulers stay in power and workers do not fight, with payoffs U_{NF} and V_{NF} (see Figure 1).

Figure 1: The strategies and payoffs of the model



(i) First, in the event of resignation, the payoffs are as explained above: rulers keep assets which have been privatized, and the workers get the rest, and after resigning the rulers cannot decide the allocation of output between rulers and workers. In other words, the only possible type of privatization undertaken by a ruler deciding to resign is the first type of privatization, and in this case the payoffs in case of resignation and no fight are therefore:[9]

[9] Privatization of type 2 makes no sense in the case of resignation, since this type of privatization implies that the rulers have the political power to forbid or let workers open private companies, which is not the case under democracy.

$$U_{NFR,1} = \gamma_1 Y(\gamma_1) - \beta Y(\gamma_1)^{10} \tag{10}$$

$$V_{NFR,1} = [1 - \gamma_1 - \beta]Y(\gamma_1). \tag{11}$$

(ii) When rulers decide to stay in power and distribute output, if the workers do not fight, they receive wages, W, and their payoff is:

$$V_{NF} = V(W) = W, \tag{12}$$

while the rulers get the rents R and the payoff is:

$$U_{NF} = U(R) = R, \tag{13}$$

where V and U are continuous utility functions for the workers and rulers, respectively. For ease of exposition, we assume that both rulers and workers are risk neutral.

(iii) If the workers fight, then with probability, p, they overthrow the regime. Assume that p, defined on the closed interval [0, 1], is a function of the allocation of output to the means of repression, β. (We could instead write that p is a function of the size of the means of repression, βY. Since either approach is plausible, we analyze the second case below). This function is convex and decreasing: $p' < 0$ and $p'' > 0$; assume further that $p(1) = 0$ and $p(0) = 1$.[11]

Should the revolution be successful, workers seize all output, while the rulers' payoff is zero. Conversely, a failed revolution leaves workers with their original consumption bundle but they are punished in such a way that their utility is set to zero for having tried to overthrow the regime. The payoffs for workers and rulers in consequence of a fight are:[12]

$$V_F = pY \tag{14}$$

$$U_F = [1 - p]R = (1 - p)[(1 - \beta)Y - W]. \tag{15}$$

[10] If we assume that sectors do not all have the same return, then the rulers first consider privatizing the best sectors, and those less affected by the negative effect of privatization. However, this does not change our qualitative result, so long as there are sectors affected by privatization, since this means that they will not privatize the whole economy, and thus there exists an optimal γ. Therefore, for simplicity, we do not analyze the difference between sectors. Also for simplicity, we do not take into account that, in consequence of corruption, rents to rulers might increase. So long as the marginal effect of corruption on output is no greater than that of disruption, our result remains unchanged.

[11] We therefore have that $1 - p(\beta) > \beta$.

[12] While there is little doubt that output is disrupted during a revolution, the output referred to in equations (14)–(15) is distributed *prior* to the revolution. To assume that a revolution will lower output does not change anything in the results.

In the case of privatization 2, we assume that if the workers in the state sector decide to fight, those in the private sector join them. As before, when workers fight, should the revolution be successful, workers seize all state output, while the rulers' payoff is zero.[13] Equation (14) in case of privatization 2 is therefore:

$$V_{F,2} = p(\beta)Y_s. \tag{14'}$$

2.2 Equilibrium

In our Stackelberg game, the rulers first decide about (i) resigning, (ii) the amount of privatization, and (iii) the allocation of output. Then, the workers decide either to fight (F) or not to fight (NF). The following lemma outlines the optimal decision of rulers as a function of the workers' decision.

Lemma 1

(i) When in the second stage workers fight, the rulers' best response in the first stage is giving them the lowest allowable payoff; that is: $W = W_f$.
(ii) When in the second stage workers do not fight, in the first stage the workers allocation of output that is optimal for rulers is: $W = pY$ *(and in the case of privatization 2:* $W_s = pA_s$*).*
(iii) When privatization 1 is chosen along the NFR solution (i.e., that rulers resign), the extent of privatization is γ_1^* *(different from zero). Otherwise (in case they do not resign and stay in power) there is no privatization (*$\gamma_1 = 0$*) whether the choice of the workers is to fight or not.*
(iv) The equilibrium rate of privatization 2 is γ_2^* *for the case of no-fight and* $\gamma_2^{*\prime}$ *for the case of fight and they are both different from zero.*

Proof

(i) and (ii):
For a non-fighting outcome to be an equilibrium it is necessary that:

$$V_{NF} \geq V_F. \tag{16}$$

[13] In the case of a revolution, it seems reasonable to assume that also the private output in the hands of the rulers will be appropriated. Since the state workers decide to fight after taking into account the allocation of state output (and not private output), we assume implicitly that the rulers' private assets are left in the hands of the private workers.

The rulers' best response is to choose the smallest W that satisfies equation (16); that is:

$$W = p(\beta)Y. \tag{17}$$

In case of a fighting equilibrium, the allocation that maximizes (15) is to give the workers the minimum, i.e., W_f.

(iii): In the event of resignation, the extent of privatization that maximizes the rulers' payoff, denoted γ_1^*, is simply the argmax of (10), since $Y' < 0$:

$$U_{NFR,1} = (\gamma_1^* - \beta)Y(\gamma_1^*) \tag{18}$$

while the workers receive:

$$V_{NFR,1} = [1 - \gamma_1^* - \beta]Y(\gamma_1^*). \tag{19}$$

Consider also the cases where rulers do not resign. The payoffs in cases of no-fight and fight are, respectively, equations (13) and (15). In both cases, the payoffs are a negative function of γ_1. Therefore, the optimal extent of privatization for the rulers, if they do not resign, is zero, and $U_{NF,1} = U_{NF}$ and $U_{F,1} = U_F$ where U_{NF} and U_F are the payoffs when the extent of privatization is zero.

(iv): For a non-fighting outcome to be an equilibrium it is necessary that the workers in the public sector are paid at least what they would receive if fighting:

$$W_s = pA_s \tag{20}$$

then substituting into (9) we get:

$$U_{NF,2} = (1 - \beta - p)A_s + H(\gamma_2) \tag{21}$$

where $H = \gamma_2[(1 - \beta)(1 - t)A_m - (1 - \beta - p)A_s] \geq 0$.[14]

Under a fight, workers are paid the minimum, $W_s = W_f$. Substituting into (15), the rulers' payoff becomes:

$$U_{F,2} = (1 - p)[(1 - \beta)A_s - W_f + H(\gamma_2) - \gamma_2(pA_s - W_f)]. \tag{22}$$

[14] Since in order for rulers to engage in private enterprise, the following inequality must hold: $(1 - \beta)(1 - t)A_m \geq [1 - \beta - p(\beta)]A_s$. Moreover recall that $1 - p(\beta) - \beta \geq 0$.

[15] It is easy to verify that $H'' < 0$. Hence, for very small t, γ_2^* may be unity.

It is easy to see that the extent of privatization which maximizes the rulers' payoff in case of NF, denoted γ_2^*, is such that $H'(\gamma_2^*) = 0$.[15] The extent of privatization which maximizes the rulers' payoff in case of F, denoted $\gamma_2^{*\prime}$ (and smaller than γ_2^*) is such that:

$$H'(\gamma_2^{*\prime}) = p(\beta)A_s - W_f. \tag{23}$$

Both payoffs have an inverted U-shape as a function of γ_2. The intuition underlying this equilibrium is that privatization leads to growth of output, which benefits the rulers. However, for too high a rate of privatization, rents fall. Therefore there is an optimal extent of privatization. As opposed to the case of privatization of type γ_1, where if the rulers did not resign the optimal value is 0, here under both NF and F, the optimal γ_2 is greater than zero. ■

The reason why the amount of privatization is a positive one is different in the two types of privatization. In the case of 'Embezzlement', privatization has two opposing implications for the rulers' rents. On the one hand, it has a negative impact on the rents since it reduces output. On the other hand, rulers keep those assets that have been privatized if they take the resignation option.

In the case of 'Market-Leninism', the rulers receive the output which remains after paying workers and financing the repressive apparatus. Thus, this form of privatization has two conflicting effects on the rulers' payoffs. On one hand, it leads to an increase in rents owing to an increase in output. On the other hand, part of the output now accrues to workers, independently of the rulers. There is, therefore, an optimal extent of privatization greater than zero.

3. Comparison between the two types of privatization

In the previous section, we derived the different optimal equilibria given the type of privatization. We turn now to determine the optimal type of privatization, in other words which type of privatization countries should adopt. Should they choose 'Embezzlement' or 'Market-Leninism'?[16] The following proposition provides answer to this question.

Proposition

When β is exogenously given,

(i) in an economy where the means of repression are sufficiently large to ensure a sufficiently low probability of a successful fight, the rulers will choose the Market-Leninism privatization with the concomitant equilibrium: ($W_s = pA_s$, $\gamma_2 = \gamma_2^*$, NF);

[16] We assume that a mix of the two types of privatization is not possible.

(ii) in an economy where the means of repression are small and the probability of a successful insurrection is sufficiently high, rulers choose the privatization of 'embezzlement for a rainy day' and the equilibrium is: ($W = 1 - \gamma_1^*$, $\gamma_1 = \gamma_1^*$, NFR).

When β is endogenous,

(iii) under Assumption (1) defined below, the optimal solution is to choose ($\beta = \beta_2^*$, $W_s = p(\beta_2^*)A_s$, $\gamma_2 = \gamma_2^*$, NF). In other words, the optimal rate of repression will lead to the choice of Market-Leninism privatization.

Proof

(i) and (ii): For a given β, the rulers will choose the equilibrium which is best for them by comparing the payoffs for privatization type 1 and 2. There are five possible payoffs in all: for privatization type 1, the payoffs are $U_{NFR,1}$, $U_{NF,1}$, and $U_{F,1}$; for privatization type 2, the payoffs are $U_{NF,2}$ and $U_{F,2}$ (see figure 1).

Recall that under 'Embezzlement for a rainy day', $U_{NF,1}$ and $U_{F,1}$ take the same values as under no privatization, U_{NF} and U_F (since the optimal amount of privatization is zero). We also showed that for each value of β, $U_{NF,2}$ under Market-Leninism is always greater than for no privatization (since otherwise $\gamma_2 = 0$ would have been optimal). We are thus left to compare 3 payoffs: $U_{\mathrm{NFR},1}$ under 'embezzlement for a rainy day' and $U_{F,2}$ and $U_{NF,2}$ under 'Market-Leninism'.

Figure 2 depicts U_{NF} and U_F (which is also $U_{NF,1}$ and $U_{F,1}$) as a function of β. We define β^* as the repression rate at which utility, U_{NF}, is maximized, and β_f as the repression rate at which utility, U_{F}, is maximized. If the subsistence level is not too low, we have that U_{NF}^* is greater than U_F^* as depicted in Figure 2 (see proof in the Appendix, where we also show that β_f is lower than β^*, as depicted in the graph).[17] $U_{NFR.1}$ is the payoff for the optimal amount of privatization γ_1^*. It is at its maximum, $U_{NFR,1}^*$ when β is zero (see equation 10).

The payoffs in case of privatization 2, $U_{NF,2}$ and $U_{F,2}$ (for the optimal γ_2 in each case), are depicted in Figure 3 as functions of β. From a consideration of equations (21) and (22), it follows that they behave in a manner that is similar to $U_{NF,1}$ and $U_{F,1}$ (when the optimal privatization is zero). $U_{NF,2}$ and $U_{F,2}$ are therefore as in Figure 2, but tilted upwards, with maximum $U_{NF,2}^*$ at a value of β_2^* which differs from β^* and is to its left as explained below.

Comparing the different payoffs as depicted in Figure 3 shows that resignation and privatization of the 'Embezzlement' type would be chosen for values of β up to β_{l1}. For higher β, the solution is to choose privatization of type 2 (and NF).

[17] However note that if the starvation level W_f is very low, rulers may be better off letting workers fight. We therefore assume that W_f is large enough to ensure that U_{NF}^* is greater than U_F^* (for the exact condition, see proof in the Appendix).

Figure 2: The rulers' payoffs in the case of Privatization 1

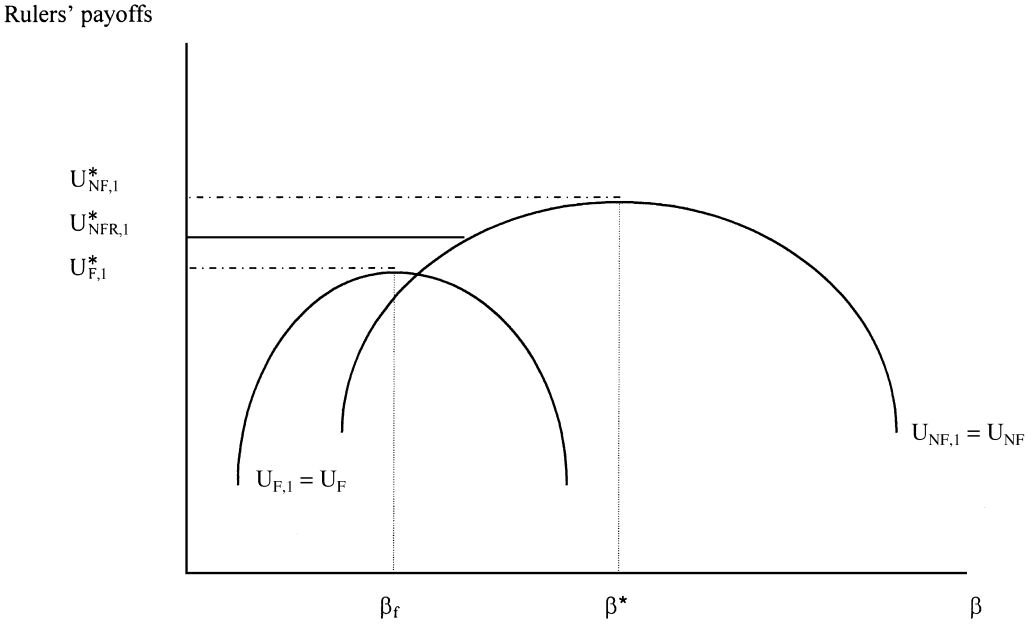
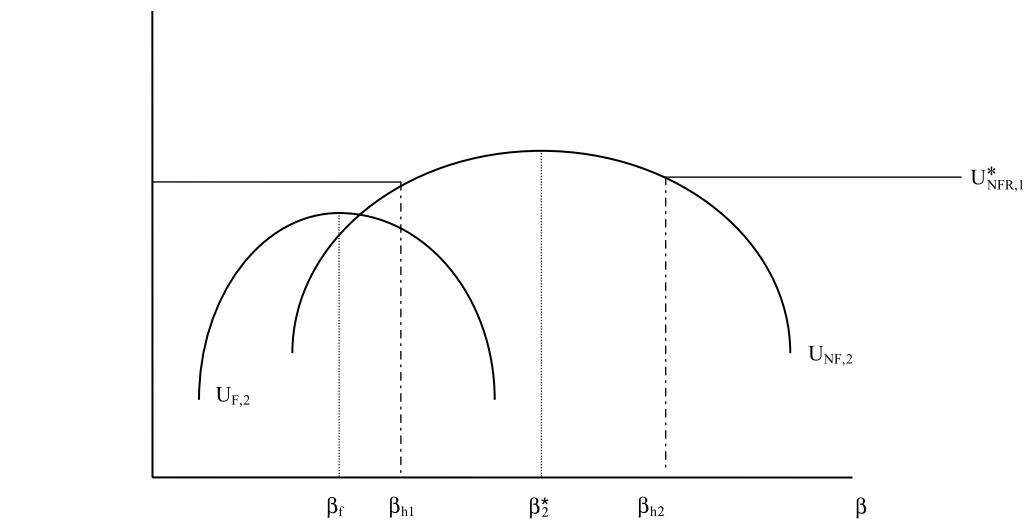


Figure 3: The rulers' payoffs in the case of Privatization 2, and NFR



This part of the proposition means that for a sufficiently high probability of successful insurrection (β lower than β_{h1}), the rulers are better off buying insurance via privatization of the economy and also giving up political power, because the expected return to either permitting a struggle or choosing NF is very low at this low level of repression. On the other hand, for a sufficiently low probability of regime collapse it is not worth buying the insurance implied by this type of privatization at the cost of a reduction in output and, hence, rents. Indeed, for sufficiently high β, rulers choose a privatization of type 2 and the workers do not fight. β_{h1} is the level of repression at which rulers are indifferent between these two cases.

(iii): We make the following Assumption:

$$\text{Assumption (1): } (1 - \beta_2^*)[1 - t(\gamma_2^*)]A_m(\gamma_2^*) \geq A_s.$$

This inequality states that the level of productivity of the new private sector is sufficiently high compared to the state sector to permit the payoffs in the case of privatization 2 to be greater than under no privatization.

In order to compare the two types of privatization, we find the optimal β for each privatization. In the case of privatization type 1, from equation (10) it is clear that the optimal size of repression is zero, and the payoff is:

$$U_{NFR,1}^* = \gamma_1^* Y(\gamma_1^*) - \beta Y(\gamma_1^*). \tag{24}$$

For the privatization type 2, in case of no fight, the rulers maximize:

$$U_{NF,2} = [1 - \beta - p]A_s + H(\gamma_2), \tag{21}$$

where recall that $H = \gamma_2[(1 - \beta)(1 - t)A_m - (1 - \beta - p)A_s] \geq 0$.

Differentiating with respect to β, we obtain:

$$p'(\beta_2^*) = -1 - [(1 - t)A_m\gamma_2/(1 - \gamma_2)A_s] < -1, \tag{25}$$

and the payoff is: $$U_{NF,2}^* = [1 - \beta_2^* - p(\beta_2^*)]A_s + H(\gamma_2).^{18} \tag{26}$$

Note that β_2^* is less than β^* since $p'(\beta^*) = -1$ (β^* is the repression rate at which utility U_{NF} is maximized).

From a comparison of equations (24) and (26) under Assumption (1), we find that the payoffs under 'Market-Leninism' are greater than under 'Embezzlement' (see Figure 3).

[18] We assume that W_f is large enough to ensure that $U_{NF,2}^*$ is greater than $U_{F,2}^*$ (see Appendix).

Had we assumed that p is a function of βY, the entire proof would have proceeded in the same way. In this case, $p(\beta Y_1)$ is tilted upwards and $p(\beta Y_2)$ is tilted downwards. In consequence, looking at equations (21), (22), the optimal utility is higher and β_{h1} (the level of repression at which rulers are indifferent between these two cases) is tilted to the left, but the essence of the solution is exactly the same. ■

In conclusion, the first part of the Proposition has underlined that the Market-Leninist path may be an equilibrium. In other words, Market-Leninism is *sustainable*. The view that economic reform leads inexorably to political reform is thus not supported by our model. When means of repression are low, it is optimal for the rulers to choose embezzlement and give up political power. Thus, when the economic reform is of the embezzlement type, there is also political reform. However, when the means of repression are sufficiently great, privatization will be of the Market-Leninism type, and the rulers stay in power.

Thus far, we have determined the rulers' optimal decision, for a given β. This is an assumption that makes sense in the short run, since to increase the size of the repressive apparatus takes considerably longer than to change the wage level; in the long run the rulers also determine the size of repression. In the second part of the proposition we considered the optimum value of β. We show that when the country can choose its optimal level of repression, it chooses an amount β_2^* which leads to Market-Leninism.

4. Comparisons between Eastern European countries and China

The proposition mentioned above states that the nomenklatura in each communist country should choose a repressive apparatus that permits the rulers to opt for Market-Leninism. While data are not available on allocations to the means of repression in China, the rulers' response to demonstrations in Tiananmen Square in 1989 and their subsequent behaviour towards dissidents provides adequate evidence of the maintenance of a strong repressive apparatus.[19] The model therefore explains the evolution in China and Vietnam by showing that Market-Leninist privatization is optimal.

What about Eastern Europe? How can this model be used to explain why countries in Eastern Europe have chosen 'Embezzlement for a Rainy Day' instead of 'Market-Leninism'?

The answer to this question hinges on the source of the funding for the repressive apparatus. In both China and Vietnam, the means of repression were

[19] Kristof and Wudunn (1994, p. 379) suggest, on the basis of admittedly rough calculations, that China's military budget might, in real terms, be the third highest in the world, after the US and Russia. It should be noted, however, that defense expenditures are a very poor surrogate for allocations to the means of repression.

domestically financed and the choice of Market-Leninism followed smoothly in accordance with the predictions of our model.

On the other hand, in Eastern Europe, part of the repressive apparatus was provided by the USSR as both subsidies and direct intervention in the form, for example, of military bases. So prior to privatization, the optimal β was in fact:

$$\beta = \beta_{local} + \beta_{USSR}. \tag{27}$$

The exogenous reduction in β due to the change in the Soviet policy which was perceived by the elite around the end of the eighties made privatization of type 1 optimal. Our model predicts that if the national means of repression in the Eastern European Countries had been bigger, and had not been based on the commitment of the Soviet Union to intervene, then it would have been optimal for the rulers to opt for Market-Leninism. When it was made obvious for them that the Soviet Union would not intervene and would let the countries democratize, the nomenklatura chose embezzlement for a rainy day, while they could still do it. Of course there are also countries like Romania, where the rulers did not predict developments in the Soviet Union and thus lost political power uninsured.

In this model, we have taken the conduct of the Soviet Union as exogenous, and shown how perestroika and the consequent reduction of aid influenced the other communist regimes in its neighbourhood. It would, of course, be interesting to go further and analyze the USSR by using and adapting this framework to try to understand why its rulers did not choose the 'Market-Leninism' equilibrium. Moreover, the geographical location of a Communist country may have an influence on the path of the equilibrium. Indeed the closeness of the Eastern European countries to the Western world may have had an influence on their equilibrium path. But this is beyond the aim of this paper and is the subject of further research.

5. Conclusion

Transition in China and Eastern Europe was implemented in very different ways: Eastern Europe has chosen 'Embezzlement', while China has chosen 'Market-Leninism'. Our model has shown that this difference in the choice of economic reforms has had implications for the political outcomes observed in these countries. Moreover, we have shown that the type of economic reform adopted by a communist government depends critically on the size of the repressive apparatus employed by the regime to stay in power at the time reform is contemplated.

The first part of the paper has shown that when the means of repression are low, it is optimal for the rulers to choose embezzlement and give up political power. In other words, when the economic reform is of the embezzlement type, political reform takes place. However, when the means of repression are sufficiently great, privatization will be of the Market-Leninism type, and the rulers stay in power.

The second part has shown that rulers choose to have a level of the means of repression sufficiently high to keep them in power. When privatization becomes a policy option, it is always preferable, *a priori*, to opt for Market-Leninism. Our model contains an even stronger message. It has been argued that communist regimes which embark upon economic reforms will inevitably have to carry out political reforms, economic freedom giving rise to political freedom; *a priori*, Eastern Europe is a proof of this contention and the conclusion is that China will follow.

Our model shows that, on the contrary, privatization as conducted in China is sustainable with no change in the existing polity. *Market-Leninism privatization does not necessarily lead to political reforms.* Tienanmen has shown that if the repressive apparatus is large enough (i.e., the probability of a successful revolt is low) the rulers will not resign. Thus, unless some exogenous change takes place, the present situation is, according to our model, an equilibrium.

On the other hand, in Eastern Europe, developments in the Soviet Union led to an exogenous reduction in the means of repression. The non-interventionism of the Soviet Union in 1989 has made it clear to communist regimes that they could not count on the means of repression of their neighbour. This sudden reduction in the means of repression rendered 'Embezzlement for a Rainy Day' the equilibrium policy. Spontaneous privatization followed, giving the nomenklatura the means to become the business elite of the new era.

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Appendix

Proof that $\beta_f < \beta^*$.
A. First let us show that $\partial\beta_f/\partial W_f < 0$ (that is; that β_f is a decreasing function of W_f). For maximizing U_F^*, the FOC is:

$$p'(\beta_f) = -[1 - p(\beta_f)]/[1 - \beta_f - \omega_f] \tag{A1}$$

when we define: $\omega_f = W_f/Y$. Therefore we have

$$\omega_f = [1 - \beta_f] + [1 - p(\beta_f)]/p'(\beta_f). \tag{A2}$$

Since $p'' > 0$, by differentiating (A2) we obtain:

$$\partial\omega_f/\partial\beta_f < 0, \text{ therefore, } \partial\beta_f/\partial\omega_f < 0, \text{ and in consequence: } \partial\beta_f/\partial W_f < 0. \tag{A3}$$

B. We define ω_f^* as the ω_f such that $\beta_f = \beta^*$.
Since β^* is such that $p'(\beta) = -1$, it follows from (A1) that:

$$-1 = -(1 - p(\beta^*))/(1 - \beta^* - \omega_f^*). \text{ Hence:} \tag{A4}$$

$$\omega_f^* = p(\beta^*) - \beta^*. \tag{A5}$$

Since $\partial\beta_f/\partial\omega_f < 0$, we get that $\beta_f < \beta^*$ for all ω_f such that $\omega_f > \omega_f^*$.
Thus, for all $\omega_f > \omega_f^*$, we have $\beta_f < \beta^*$.

Proof that $U_{NF}^* > U_F^*$ for $W_f > \bar{W}_f$
$U_{NF}^* > U_F^*$ requires:

$$\Psi(\beta_f) = 1 - p(\beta^*) - \beta^* - [1 - p(\beta_f)][1 - \beta_f - \omega_f] > 0. \tag{A6}$$

Substituting ω_f from (A2) we get:

$$\Psi(\beta_f) = \lambda + [1 - p(\beta_f)]^2/p'(\beta_f) \text{ where } \lambda = 1 - p(\beta^*) - \beta^*. \tag{A7}$$

Since $\Psi(0) > 0$ and $\Psi' < 0$, we denote $\bar{\beta}_f$, such that $\Psi(\bar{\beta}_f) = 0$.

Therefore for $\omega_f > \bar{\omega}_f$ i.e., $W_f > \bar{W}_f$ we have $\Psi > 0$, where

$$\bar{W}_f = [1 - \bar{\beta}_f] + [1 - p(\bar{\beta}_f)]Y/p'(\bar{\beta}_f). \tag{A8}$$

The proof that $U_{NF,2}^* > U_{F,2}^*$ is done in a similar way.