Promotion contracts and bureaucratic rents: economic foundations of a one-party regime

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Abstract

This paper analyzes the economic foundations of a one-party political regime, where the ruling bureaucracy captures rents through collective control over state property and job assignment. Stability of such a regime and the potential for endogenous institutional change are key issues in the transition to market economy and democracy in former socialist and many developing countries. Our model of one-party regime is based on the notion of an implicit contract between the incumbent bureaucracy and “activists” seeking promotion into rent-paying positions, whereby the latter exchange their supervisory services for deferred promotion. This contract allows the bureaucracy to increase its rents at a cost of retirement. Demand for activists’ services is correlated with public investment and declines with the accumulation of capital in the public sector. Time inconsistency is inherent in this contract. The ensuing drift away from the long-run optimal contract reduces the supply of activists. Eventually, the cost of borrowing activist services by the ruling bureaucracy exceeds the rents it produces, and the bosses abandon collective proprietorship and single-party organization that serve to facilitate this exchange. We test our model using political and economic data from a panel of former Soviet republics and find significant support in its favor. Long-run trends of communist party recruitment in the USSR and the end of the Soviet regime in 1991 are consistent with our model. The latter resulted from the breach of promotion contract by the party bureaucracy and declining returns to public investment.

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Introduction

For millennia, autocracy was the prevalent form of political organization. Despite the advancement of democracy, the majority of the world’s population still lives under regimes that range from outright dictatorship to oligarchy, embellished with nominally democratic institutions. Empirical studies establish and theoretical literature explains the superior economic performance of democracies. Resilience of non-democratic regimes and conditions that enable (or preclude) transition to democracy are therefore research problems that need to be addressed by economists. Pioneering works associated with the name of Mancur Olson (Olson 1993, McGuire and Olson 1996, Olson 1995) provide theoretical insights into the relative stability of dictatorship, as well as its inherent tendency to devolve from a growth-promoting “stationary bandit” into a rent-seeking oligarchic regime. The central Olsonian notion of a long-run revenue maximizing dictator, which is an adaptation of a more general “Leviathan” interpretation of government (Brennan and Buchanan 1980), brings economic motivations of rulers in a non-democratic polity to the foreground. It leaves out of consideration, however, the political costs of exercising dictatorial power. By contrast, theoretical models developed by Grossman and Noh (1994) and Wintrobe (1998) assume power-maximizing rulers and focus on political exchange per se.

Economic research in the area of non-democratic regimes is deficient in the following three aspects. First, there is a general lack of empirical studies, which is largely due to the closed nature of such regimes. Second, little has been said about interaction between polity and economy, a topic that attracts significant attention in connection with democracies. Third, non-democratic regimes are often represented simplistically as dictatorships driven by decisions of a single omnipotent ruler, while in reality personal dictatorship is but a tip of the iceberg of a hierarchically structured military or civil bureaucracy. This paper attempts to address all three issues in application to one-party regimes, often designated as totalitarian. They spread throughout the world in the twentieth century in diametrically different ideological packaging: from racist/fascist (Germany, Italy, Spain) to communist (USSR, China, Cuba and many others). They all share a number of common features that provide a stark contrast to the principles of free-market democracy. The most important features include: hierarchical political organization; encompassing bureaucratic control over production and allocation of goods, backed by state ownership of a large share of the capital stock; autarky; and pervasive police repression combined with political manipulation aimed at raising popular support. Numerous regimes in developing countries, nationalist (e.g. Indonesia) or theocratic (Iran), are similar to those mentioned above, although their leaders typically avoid direct management of national economies. Some of these regimes have been forcefully removed as a result of military defeat as was in the case of the German
Second Reich. Others gradually evolved into market democracies (Spain). The nations of Eastern Europe and the former Soviet Union opted out through a revolutionary change of regime in 1989-1991 that opened the way for radical pro-market reforms. The direction of change of remaining regimes of this kind, such as China, North Korea, or Iraq is still an open question.

The case of the Soviet Union, the most influential and lasting totalitarian regime thus far, deserves special attention. The most surprising feature is that its end, largely unforeseen by analysts, was rapid and peaceful despite its seemingly uncompromised coercive power, and it caused little turnover in the higher tiers of economic management and government. The Soviet experience raises questions about the sources of stability of one-party regimes and the limits of their sustainability, as well as the potential for endogenous institutional change. In particular, this course of events suggests a possibility of the ruling bureaucracy initiating the change. Explanations for this choice should be based on the analysis of political-economic exchange between the rulers and the population.

Our hypothesis is that the stability of a hierarchy rests on life-long implicit contracts. One party to such a contract is the incumbent officials (“bosses”), who need loyal agents to supervise the working population. The other party is “activists” - people able to fulfill this task and seeking promotion into the top ranks of the ruling bureaucracy. Total control by the bureaucracy over the economy leaves an activist practically without any outside option. On the one hand, it is impossible to reach higher levels of income without engaging in exchange with the incumbent bosses. On the other hand, a significant bureaucracy premium – the difference between bureaucratic rents and the wages of working population – creates an incentive for the activist to enter into the contract with the bosses. The terms of this contract assume that activists volunteer their services to the incumbent bureaucrats, thus allowing the latter to increase their rents. In exchange, after a number of years of services, activists get promotion into a rent-paying position. The incumbent bosses have either to retire or to create new positions to accommodate the activists whose contracts have reached maturity. Given a certain rate of future discounting, the contract is beneficial for the bosses and the activists because it maximizes expected life-time incomes for both groups. However, this contract is not self-enforcing. Once incumbents reach the end of their tenures, they are tempted either to renege on the contract or to resort to a “Ponzi scheme,” whereby new boss positions are paid by increased recruitment of new activists.

We will show that a dictatorial regime can facilitate a quasi-stationary behavior of this system by periodic forceful expulsions of incumbent elite members. Under an oligarchic regime, bureaucrats

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1 Relatively high stability in the ranks of economic managers and bureaucracy has been established for most East European and former Soviet nations (Best and Becker 1997).
cannot commit to timely retirement. This leads to degrading incentives for the incumbents to maintain the contract and a decreasing supply of activists from the population. Eventually, the contract is no longer renewed, and the collective proprietorship and one-party hierarchical organization that facilitate the exchange become obsolete. According to our model, the end of a one-party regime is the result of an implicit consent of both the bosses and the activists not to renew the contract.

Empirical testing of the models of non-democratic regimes is a challenging task. It is in the best interest of the bosses not to reveal their deviation from the terms of the contract. They tend to distort or conceal information that may have an adverse effect on the supply of activists and, consequently, on bureaucratic rents. As a result, researchers have little access to reliable data, too. For example, the Chinese government prohibits collection of any data that pertain to party members (Dickson and Rost 2000). Fortunately, data sources from the former socialist countries are no longer guarded, allowing *post mortem* economic analysis of one-party regimes. We use in this paper data series from a cross-section of nine Soviet republics from the period of 1956-1968 to estimate the parameters of supply and demand for activists.

The paper proceeds as follows. Section I introduces the promotion contract in hierarchies as a mechanism of political-economic exchange between the ruling bureaucracy and the population. A formal model of an implicit contract between the bureaucracy and career-seeking activists is developed in Section II. This section also discusses relationships between production technology and demand for activists and time inconsistency in the promotion contract. The test of proposed model using panel data from former Soviet republics is presented Section III. Section IV applies the developed model to interpret long-run trends in the communist party membership and the final rejection of the collectivist organization by the Soviet ruling bureaucracy. Section V concludes.

1. Political-economic exchange under one-party regime

Non-democratic regimes use some political and/or economic devices to prop up their coercion effort with the voluntary support of their subjects. Some recent formal political-economic models of a non-democratic state take this into account by assuming that the rulers can produce public goods to raise loyalty (Grossman and Noh 1994; Wintrobe 1998). This “loyalty purchase” approach is fully adequate if one or both of two conditions hold. First, the ruling agent (dictator government, or ruling elite) is not a “rational predator” (a net-revenue-maximizer, who regards political power only as an instrument of revenue collection). Second, the population believes that a given government is the best or the only possible producer of public goods. If the rulers value power per se, as both above-
mentioned studies assume, or if the taxed population is subject to illusions about the costs and benefits of governmental services, then the rulers can gain disproportionately, relative to the costs, from public goods production. If neither condition holds, that is, both the rulers and the population are fully rational, then public expenditure is simply a tax refund that makes the population better off, while reducing political rents. Associated transaction costs will normally make the net welfare effect strictly negative.

Notwithstanding possibility of deviations from rationality, we consider a method to raise support that is consistent with the rationality of political-economic agents, namely, recruitment into the ranks of the ruling party with subsequent promotion to higher-paid positions. The rulers who control opportunities for upward mobility can raise political support and additional productive effort from a part of the population in exchange for deferred promotion. The loyalty involved is of a purely material kind, and it brings about not a loss (payment to the population in public goods) but an increase in political rents. By recruiting agents from the population, incumbent rulers provide an incentive for aspirants to the rent-paying positions to volunteer extra effort – typically in the form of supervisory services – in exchange for the prospect of promotion. In other words, a ruling bureaucracy “borrows loyalty,” increasing its rents, at least in the short run.

The effectiveness of loyal-service-for-promotion exchange depends on the extent to which a bureaucracy is capable of controlling the sources of income and, therefore, the paths of upward job mobility. Communist states of the twentieth century, by establishing a near monopoly on the ownership of productive capital, created the most favorable conditions for such control. In the Soviet Union, a nomenklatura system of job assignment, run by the ruling party, provided an institutional mechanism for awarding promotion “tickets” in exchange for loyal service. However, state property and command economy are not a prerequisite for loyalty borrowing. Any governmental intervention in the economy assigns resource allocation power to bureaucracy, and therefore enables capture political rents in the form of pervasive corruption (Ehrlich and Lui 1999). Indonesia is an often-cited example. In general, all single-party regimes establish some sort of system of universal bureaucratic control

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2 Grossman and Noh (1994) posit that the ruling elite maximizes the probability to stay in power, while Wintrobe (1998) assumes that the maximand is the (extent of) political power, an allegedly quantifiable variable.

3 Defense and criminal law enforcement seem to be important exceptions. However, these can be considered as a part of costs associated with revenue production, insofar as they protect the tax base from rival predators (foreign aggressors and domestic bandits).
over promotion, although in many non-communist developing countries it tended to be more heavily dependent on family ties and local cliques, as in Mexico under the political monopoly of PRI (Camp 1999). The military-bureaucratic pyramids of Qing China and Imperial Russia in eighteenth century, medieval Catholic theocracies and orders are just a few of numerous historical analogs to the nomenklatura. Also, any military dictatorship, supported by the hierarchy of army command, is a close relative of a one-party regime.

In the following, we focus on the case of the Soviet Union as representative for a large class of political-economic structures that employ nomenklatura-type exchange between the incumbent rulers and the promotion-seeking activists. We will examine economic incentives for both bureaucrats and workers-activists and the determinants of demand and supply of activist services. We will also discuss and the impact of changing incentives to enter the contract on the trends of ruling party membership and the regime dynamics in general. Communist regimes are just one extreme historical realization of bureaucratic rule. It is possible that some of the results may not be applicable to a broader class of non-democratic regimes. However, study of the Soviet Union has advantages arising from the following two factors. The first factor is its relative institutional simplicity. Dominant state ownership and fusion of political and economic administration produces a single hierarchy. Within this framework political supporters of the regime are at the same time supervisors in the workplace. The boundaries between sectors and hierarchical levels are, at least in principle, transparent. The policies with regard to wages, promotion, job assignments, etc. are same or similar in the spheres of administration and production, across industries and regions. Therefore, the Soviet-type political-economic system on the whole can be regarded as one enormous corporation. This simplifies the analysis and allows to apply methods developed for the study of provision of incentives in firms. The second factor is that the high degree of centralized bureaucratic control resulted in accumulation of data by governmental statistical offices. Such accumulation can hardly be expected under a looser regime, in particular in countries where bureaucratic rents come largely from corruption and/or where promotion is based on family ties and clientelism. Soviet data are becoming increasingly available and form the basis of the empirical analysis in this paper. We discuss the extent and peculiar features of the data in Section 3.

4 Voslenskii (1984) applied the term nomenklatura to label the Soviet ruling bureaucracy itself. Although this usage of the word has became popular, we use it in a narrower sense, which is more accurate historically.

5 Recent surveys of literature on promotion-related incentives can be found in Prendergast (1999) and Valsecchi (2000).
To understand the dynamics of a one-party regime, it is crucial to give a correct representation of underlying political-economic exchange. Although the ruling party is a multi-layered hierarchy, we split it, for the purpose of tractability, into two large groups. The first group, “bosses”, consists of the holders of governing positions (party bureaucracy proper). The second one, “activists,” consists of the aspirants to these positions. The border between the two groups is hard to define in a precise way and it can change over time. In the early period of the Soviet regime, the distinction between the “candidates” – new recruits on probation – and the full party members drew the formal line. As the party was growing, the class of actual activists came to include part of rank-and-file full party members. However, the relative positions of the two groups remained essentially the same. The bosses enjoy salaries and benefits well in excess of the average level, while the activists retain ordinary jobs. The activists are required to pay dues, work more, and render additional services, in particular, supervisory services. The latter is the most important since the effort of an able supervisor is likely to yield higher a return - increased production by a team of workers - than any other one. What Soviet propagandistic literature used to say about a worker joining the party can be translated as: more effort, additional duties, promotion to in the future to a position in party bureaucracy or administration.\footnote{For example, a Soviet sociological review of 1970s purports: “Once you become a communist, you assume voluntarily an additional heavy duty to lead the others.” A characteristic career path of a new working class party recruit is described in the following manner: foreman - student in an engineering school - head of planning department in a large enterprise. The next step would be further up the ladder of industrial management or to an entry-level position in the party bureaucracy. Eighty percent of party bureaucrats of that period followed this sort of promotion path (Rabochii; pp. 225-234).}

The main distinguishing feature of the nomenklatura is the peculiar mechanism of inter-layer exchange. The incumbent elite enters in an implicit contract with activists, according to which the latter pay to the former in money (membership fees) and in kind (extra labor and supervisory services) in exchange for the prospect of promotion. As long as the activists are content with the terms of the contract they also provide political support to the incumbent rulers. In the short run, the costs of this nomenklatura arrangement are borne by the activists. Formal admittance to the party does not make them better off immediately. Their positions yield a lower utility than that of an ordinary worker. Moreover, the probability of being promoted in the future may be quite low, because the demand for supervisory agents typically exceeds the number of rent-paying positions. However, high inequality, which is the easier to maintain the poorer the country, makes pursuit of a bureaucratic career a game with high stakes.
Bureaucracy bears its share of costs, too. First, it has to protect its rents against potential rivals and overcome resistance of working population to redistribution of national income. This requires permanent coercion of some sort that is costly. Second, the incumbent has to repay debt to the activists, who have faithfully performed their duty, by promoting them into boss positions. Unless sustained economic growth creates a sufficient number of new positions to satisfy the activists’ demand, the incumbent bosses have to repay the debt by retiring. As long as the bureaucracy is a collective proprietor, a bureaucrat’s benefits are largely *ex officio*. The possibilities to accumulate personal wealth are narrow. Therefore, retirement is a gloomy prospect for a bureaucrat, especially if he internalizes the utility of his descendants.

Recent political-economic models of the ruling party in a Soviet-type system describe party recruitment process differently. Schnytzer and Sustersic (1998) in their study of socialist Yugoslavia assume that the party membership is a demonstration of loyalty that comes in exchange for the rents distributed to the population. Gershenson and Grossman (2001) treat admission to the Party as immediate cooption to the ruling elite. The costs of cooption are borne by the incumbent elite, whose budget is fixed. Thus the direction of transfer in both models is top-down, and the high party membership signifies the stability of a regime, which comes at the expense of bureaucratic rents.

The political science literature seems to agree with this conclusion, focusing on the decline of party membership in the last two years of the Soviet regime as a major indicator of its weakness (e.g., Gill 1994). It is difficult, however, to see any imminent threat to the regime at the right end of the graph of the Soviet Communist party membership (Fig. 1). The party underwent five apparent recessions in its history. Each recession involved larger contractions of total membership than the last one, yet none caused the regime to collapse. An opposite line of reasoning points to the steady growth of party ranks as the cause of the collapse: the party became too large. By the late 1980s, communist party incorporated about one tenth of the adult population of the USSR. However, it would have been quite natural for a totalitarian party to strive to recruit the total population into the cohort of activists. From this perspective, ten percent was by no means a large number.

We maintain here that the nomenklatura system rested not on top-down transfers, but on a more complicated schedule of payments, a political analog of public debt. Consequently, growing party membership per se is not indicative of the regime’s strength. What matters is the dynamics of borrowing and repayment of political debt to activists as reflected in the rates of growth of each layer of the party. Corresponding time series (Fig. 2) exhibit complex dynamic patterns. The first period,

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7 Even if the coercion is purely ideological it is still costly, although the costs are restricted to expenditures on political propaganda, indoctrination, “buzzers” to jam *Radio Freedom* broadcasts, etc.
approximately coinciding with the period of Stalin’s dictatorship, 1929-1953, is characterized by wildly fluctuating rates of change in the number of full party members and largely countercyclical movement in the number of candidates. This dynamic was driven by interchanging recruitment campaigns and “purges,” the largest being the notorious “Great Terror” of 1937-1938. The second period is characterized by smoother changes and widening gap between the number of candidates and the number of new full members. The most pronounced trend of this period is the steady decline in the rate of turnover in the highest ranks of the party bureaucracy that virtually halted in 1970 (Clark 1989). However, periodicity is apparent in both periods. We have access to the data that cover a period of almost one full wave of the Soviet political cycle, 1956-1968, and use them to test our model in Section 3. We will show that the underlying mechanism was essentially the same in both periods, although the difference in political regimes is responsible for the dissimilarity in the observed patterns.

2. A model of promotion contract

2.1. Basic model

Following the approach outlined above, we model one-party regime as an implicit contract between two agents: the bosses and the activists. Activists can be recruited from the working population that is paid uniform wage, $W$. The contract is life-long; once written, it is supposed to be non-renegotiable (we will relax this assumption later). However, the contract terms may vary for each successive cohort of activists. Both parties involved maximize their expected residual life-time incomes. If a worker chooses to become an activist, he or she gets the same wage as before and, additionally, provides services to the bosses, $a$. After $T_a$ years of service, he or she receives a deferred compensation in the form of promotion. Boss positions pay rent that by far exceeds regular wages, $R >> W$. Only a share of activists, $\pi$, gets actual promotion. The activist service incurs a disutility with a wage equivalent of $x_i(a) < 0$. We assume that $x_i$ is idiosyncratic and distributed in the population with c.d.f. $Z(x;a)$ parameterized by the required level of service, $a$. There is no outside option for an activist: the only way to achieve an income exceeding the uniform wage of the working population lies on the bureaucratic career track.

The terms of activists’ service resemble wage tournaments (Lazear and Rosen 1981), whereby employees of a firm compete for promotion from a lower wage level to a higher one. Competition elicits extra labor effort from the employees that receive compensation below their marginal product. In a simple two-period setting, a firm’s gain from the wage tournament is the inverse function of the probability of promotion that can be established at an arbitrarily low level. In the context of the life-time contract, future discounting and disutility of required additional services create a constraint that
may leave all workers disinterested in becoming activists. Generally, the choice to become an activist will be made by a worker whose lifetime utility of income along bureaucratic career path (the stepped profile in Figure 3) exceeds income as an ordinary worker (the smooth line in Figure 3).

Assuming exponential future discounting at a rate, $r$, activist’s participation constraint is:

$$
\int_0^{Ta} (W - x_i(a)) e^{-rt} dt + \pi \int_0^{Ta+Tb} Re^{-rt} dt + (1 - \pi) \int_0^\infty We^{-rt} dt \geq \int_0^\infty We^{-rt} dt
$$

where $T_b$ is the length of bureaucratic tenure.

If the rate of future discounting for the population here is about three percent per year, as the literature suggests, and the time periods do not to exceed several decades, then the exponents in (1) can be reasonably well approximated with the first-order Taylor expansion which yields upon transformation the following self-selection condition:

$$
x_i(a) \leq \pi [RrT_b - W(1 - rT_a)]/(rT_a)
$$

The supply of activists is then the left tail of the distribution of the disutility from the activist service:

$$
N_{a^+} = NZ\{\pi [RrT_b - W(1 - rT_a)]/(rT_a)\}
$$

where $N$ is the total working population.

It is can be easily verified that the supply of activists has the following properties, which reflect the costs of service and the expected benefits of promotion:

$$
\partial N_{a^+}/\partial R > 0, \partial N_{a^+}/\partial W < 0, \partial N_{a^+}/\partial T_a < 0, \partial N_{a^+}/\partial \pi > 0, \partial N_{a}/\partial a < 0
$$

Negative sign of $\partial N_{a^+}/\partial W$ reflects increasing opportunity costs for a potential activist when the inequality diminishes and is guaranteed by assumption $rT_a < 1$. The sign of $\partial N_{a^+}/\partial T_a$ is determined by the sign of $-RrT_b + W$. Since earnings inequality is sufficiently high, $R >> W$, by assumption, we can presume that this derivative is always negative. $\partial N_{a}/\partial a$ is negative by construction of $Z(\cdot)$.

Incentive for an incumbent bureaucrat to enter the contract arises from returns to the activists’ service. Let us assume that in the absence of activists, boss rent is limited to the base rent, $R_0$, which is per capita revenue that comes from taxation and side-payments. $R_0$ measures the bureaucrats’ productivity in rent-collection and is related to the national product.8 In order to avoid specific assumptions, $R_0$ is taken here as an exogenous parameter.9 Labor supervision, political propaganda,
or even assistance in collecting taxes provided by the activists increase the rents by a factor that is a function of the activists’ input, \( f(aN_a) \), where \( N_a \) is the number of activists. We assume that \( f(\cdot) \) is a concave function of activist input: \( f’ > 0, f’’ < 0 \). The cost of these additional rents is retirement after \( T_b \) years in office. Without the contract, the bosses expect to stay in office until \( T_m > T_b \). In particular, \( T_m \to \infty \) implies that the bosses bequeath their positions, i.e. they are hereditary autocrats or private proprietors. Therefore, the bosses are to choose between the “gold today” and the “eternal life;” higher rents versus longer tenures (see Figure 4). We ignore post-retirement payments assuming their present value at the time the contract is signed is negligible in comparison to wage or rent income.

Promotion contract is beneficial for the bureaucracy as long as it transfers the resources from the population through the voluntary activist services. However, the bureaucracy is a sort of partnership where extra effort exerted by “junior partners” (activists) should eventually be compensated by their promotion into the ranks of “senior partners” (bosses), facilitated by retirement of the incumbents. Under certain conditions, determined by rent-productivity of activists and the rulers’ expectations of stay in power, it is rational for the bosses to enter the contract with the activists:\(^\text{10}\)

\[

t_0^T_b R_0 e^{-rt} dt \geq t_0^T_m R_0 e^{-rt} dt
\]

(5)

Upon integration, we get:

\[
f(aN_a) \geq (1 - e^{-rT_m})/(1 - e^{-rT_b})
\]

(6)

Taylor expansion allows to elucidate the principal properties of the bosses participation constraint, when the expected length of stay in power, \( T_m \), and contract tenures are low. It yields the condition stating that the activists’ output should offset the tenure cut:

\[
f(aN_a) \geq T_m / T_b
\]

(7)

It follows from (7) that whenever rulers feel that their power is more secure (e.g. after a military victory or after suppressing political opposition) \( T_m \) increases. Thus, a possibility arises that the bosses’ participation constraint will be violated and the ruling bureaucracy will opt of promotion contract. Conversely, increasing threat of aggression is likely to create favorable conditions for a one-party regime to emerge.

At the other extreme, when the power is considered to be absolutely secure \((T_b, T_m \to \infty)\), (6) transforms into:

\(^{10}\) Alternatively, we can think of (5) as the shutdown rule for the bureaucratic partnership.
f(aN_a) \geq e^{rT_b}, \quad (8)

which implies that a stable regime’s participation constraint is merely a relationship between the boss tenure and the productivity of activists. In general, bosses’ participation constraint is a convex downward-sloping curve in the \((N_a, T_b)\) plane. This follows from the properties of \(f(\cdot)\) and the derivative of the right-hand side of (6) with respect to \(T_b\): 

\[ -T_b e^{-rT_b} \left( 1 - e^{-rT_m} \right) \frac{1}{(1 - e^{-rT_b})^2}, \]

which is always negative, approaches zero as \(T_b\) tends to infinity and vice versa.

While inequalities (6-8) establish existence conditions for a promotion-based hierarchy, sustainable claims for the activists’ services in a static economy are additionally constrained by the stationarity requirement. The number of activists promoted into boss positions per unit of time should equal the number of retiring bosses:

\[ \pi N_a / T_a = N_b / T_b \quad (9) \]

Actual recruitment (the number of openings for the new activists) can exceed \(N_a\) determined by (9) for a number of reasons. First, promotion can exceed retirement if the economy is becoming more productive and new boss positions are created without loss in rents or increases in the tax rate. Therefore, \(N_b\) in (9) should be regarded as the expected number of bosses by the time the contract reaches maturity, which may exceed the current number. Second, exogenous factors, such as a threat of war or uprising, can cause excessive borrowing of activist services. Finally, the ruling bureaucracy can lure unsustainable amount of activist into the party ranks following the motto of all myopic rulers, coined allegedly by the French king Louis XV: *apres moi, le deluge*. We will not model these factors explicitly. Rather we focus here on the stationary turnover as the benchmark regime and discuss causes and effects of deviations from stationarity later in this section.\(^{11}\)

Unlike workers, who have no control over promotion, behavior of the bosses is not determined by the participation constraint only. They choose parameters of the contract so as to maximize the net return from entering the contract. We can rewrite (5) to transform it into the definition of the bosses’ net benefit (“profit”) from the exchange with the activists:

\[ \pi = \int_0^{T_b} R_0 f(aN_a) e^{-rt} dt - \int_0^{T_m} R_0 e^{-rt} dt \quad (10) \]

\(^{11}\) Note that, under certain circumstances, all stationary regimes may lie outside the set of acceptable contracts. Technically, this happens when the stationary line defined by (9) lie below the participation constraint (4) in the \((N_a, T_b)\) plane. This does not preclude emergence of one-party regimes but dooms them to be relatively short-lived because they imply continuous increase in the size of the ruling bureaucracy.
The bosses’ optimization problem is then:

$$max \ \pi \ \text{subject to stability constraint (9)}.$$  

First-order condition to this problem is:

$$(R_0/r)[af'(aN_d)(I - e^{-rT_b}) - (T_b/N_a)e^{-rT_b}rf(aN_d)] = 0$$  \hspace{1cm} (11)

where $T_b = N_bT_a/\pi N_a$. We derive the bosses’ demand for activists’ services, $N_{a}^{d}$, from (11) following the same procedure as we did earlier for the supply function – using first-order Taylor expansion. Resulting relationship determines the demand implicitly:

$$aN_{a}^{d}f(aN_{a}^{d})/f(aN_{a}^{d}) + rT_b - 1 = 0$$  \hspace{1cm} (12)

The right-hand side of (12) is the ratio of marginal and average products of activist services, which we denote $X$. By assumption, $f(\cdot)$ exhibits diminishing returns, therefore, $dX/dN_a < 0 \cdot X$. Since $\text{max}(X)=1$ (at $N_a = 0$), boss tenure is always positive.

By implicit function theorem:

$$\frac{\partial N_{a}^{d}}{\partial T_b} = -\frac{\partial F/\partial T_b}{\partial F/\partial N_a} = -\frac{r(dX/dN_a)}{dX/dN_a} > 0$$  \hspace{1cm} (13)

where $F$ denotes the left-hand side of (12). Therefore, the demand for activists’ services increases in the duration of the boss tenure. By substituting $N_b T_a/\pi N_a$ for $T_b$ into (12), we can determine the effects of other parameters on the demand for activists:

$$\frac{\partial N_{a}^{d}}{\partial T_a} > 0, \frac{\partial N_{a}^{d}}{\partial N_b} > 0, \frac{\partial N_{a}^{d}}{\partial \pi} < 0$$  \hspace{1cm} (14)

Comparison of (4), (13), and (14) shows that the signs of derivatives of the supply and demand functions are opposite with the exception of boss tenure, $T_b$, which has a positive effect on both. The question arises concerning the existence of equilibrium. To analyze this problem, we should first note that both supply and demand curves originate at $T_b = 0$ and $N_a = 0$. Further, according to (3), derivative of supply with respect to $T_b$ follows the path of p.d.f. $z = Z'$:

$$\frac{\partial N_{a}^{s}}{\partial T_b} = N\pi Rz(z)$$  \hspace{1cm} (15)

and, therefore, it approaches horizontal asymptote (or is horizontal if the distribution is uniform). By contrast, the derivative $\partial N_{a}^{d}/\partial T_b$ is increasing in $T_b$, starting with $\partial N_{a}^{d}/\partial T_b = r$ at $T_b = 0$. Therefore, the two curves may have zero, one, or two points of intersection. Moreover, one or both equilibria, if exist, may lie below the bosses’ participation constraint. General analysis of this problem is complicated and goes beyond the scope of this paper. In the following, we will presume that an equilibrium exists and the system we consider is in its neighborhood, such as in Fig. 5.
2.2. Economic conditions and the terms of promotion contract

Economic performance variables do not enter choice criteria in our model directly. The simplest way to account for economic growth is to add rate of growth that augments both wages and bosses’ rents. In this case, we should replace $r$ in our model with effective rate of future discounting equal to $(r-g)$, where $g$ is the rate of economic growth. Upon transformation, (3) and (13) yield the derivatives of the supply and demand for activists with respect to $g$:

\[
\frac{\partial N_a^s}{\partial g} = - N \pi W_z (-r-g)^2 < 0 \tag{16}
\]

\[
\frac{\partial N_a^d}{\partial g} = T_b / (dX/dN_a) < 0 \tag{17}
\]

An intuition behind (16) is that the rents forgone by the bosses due to “early” retirement appreciate with economic growth. For the workers, economic growth means relatively lower cost of activist service. This should increase the supply of activists, but increasing value of future wages on non-activist career track offsets this effect. In addition, (13) and (15) imply that higher rates of $g$ correspond to lower tenure elasticities of the demand and supply functions. Therefore, accelerating economic growth discourages both types of agents from entering the contract and drives the equilibrium contract downward and to the right in the $(N_a, T_b)$ plane. If this happens, the system approaches the bosses’ participation constraint (see Fig. 6). Finally, if the rate of economic growth permanently exceeds $r$, it follows from (3) and (13) that incentives are reverted, and it is no longer beneficial for the bosses to retire ($T_b \rightarrow \infty$) and for workers to seek promotion contracts ($N_a^s = 0$). In other words, sustained economic growth works to destroy hierarchies.

This result is suggestive in cases of non-democratic regimes that exhibit sustained high rates of economic growth, such as China. It has, however, little relevance as applied to most non-democratic regimes. They are typically stagnant or grow slowly. USSR was no exception to the rule. Rates of Soviet GDP per capita growth seldom exceeded three percent per year, and the higher rates not always translated into significant increases in per capita consumption (Ofer 1987). To the contrary, the fast growth of the 1930s, achieved through heavy investment in physical capital, was accompanied by decreasing consumption. Growth rates per se never appeared to challenge the stability of the regime in the USSR. It was certainly not a secular increase in growth rates that paved the way to the end of the regime. The opposite trend was characteristic of the last three decades of the Soviet economic development.

While constant moderate long-run rates of growth do not change the behavior of agents, unanticipated improvements in economic performance (even in nominal terms, i.e. caused by a surprise inflation) might affect the bosses’ decisions. If higher level of output allows the bosses to appropriate larger rents, then a temporary increase in output creates a space for maneuver.
Bureaucracy can create new positions paid from the surplus and promote current cohort of activists without retiring a group of bosses reaching the end of their tenure. This change inflates expectations of tenure length, shifting both supply and demand for activist upward. Subsequent slowdown will push the equilibrium in the reverse direction—towards shorter tenures and lower numbers of activists. It will also call for increased turnover within the bureaucracy as a result of deferred retirement. Therefore, macroeconomic fluctuations can produce regime dynamic that is distinct from the one described above. We can term this dynamic quasi-stationary because of positively correlated movements of tenures and the numbers of activists occurring along the line determined by the stationarity condition (9) (see Fig. 6).

Expectations of changing economic performance have an effect similar to that of economic fluctuations. In particular, increases in government investment can produce expectations of higher rents in the future and shift the bosses’ demand for activists temporarily up. Investment has, however, an additional significant effect on the demand for activist services. The discussion of the activist services earlier in this paper suggests that their supervisory or propagandistic functions should elicit higher effort from workers and increase the efficiency of labor input in the economy. In other words, activist services is a sort of labor-augmenting technology. Let us suppose that the economy’s output is determined by a CES production function of the following structure:

$$Y = [K^\rho + ((1+A)L)^\rho]^{1/\rho}, \quad (18)$$

where $A = aN_a$ is the total input by activists, $L$ is labor, and $K$ is capital.

Functional dependence between $Y$ and $A$ given by (18) is essentially a specification of the product of activists’ services, $f(aN_a)$, which was introduced earlier. The key parameter of our model, $X$ – the ratio of marginal and average product of activist services – then becomes:

$$X = \frac{\varepsilon}{(1-X)^2} \left[ \frac{\partial X}{\partial K} \right] = \frac{\varepsilon}{(1-X)^2} \left[ \frac{\partial X}{\partial K} \right] \quad (19)$$

Combination of (9) and (12) yields the derivative of the demand for activists with respect to capital:

$$\frac{\partial N_a}{\partial K} = rT_b(1-X)^2(\partial X/\partial K) \quad (20)$$

Therefore, the sign of the effect of investment on the demand for activists is determined by $dX/dK$. The latter equals:

$$\frac{\partial X}{\partial K} = -\varepsilon (1+A)^{\rho-1}L^{\rho-1}K^{\rho-1} \left[ K^\rho + (AL)^\rho \right]^{-2} \quad (21)$$
Empirical studies show that the elasticity of capital-labor substitution was well below unity in the Soviet economy.\textsuperscript{12} This implies negative $\rho$ and ascertains that a higher scale of investment in a state-run economy results in an increasing demand for the services of the activists-supervisors ($\frac{\partial N_a}{\partial K} > 0$). Analysis of (20) sheds the light on the relationships between party dynamics and investment policy. We are particularly interested in the case when the number of activists is sufficiently large so that $A >> 1$ and $AL >> K$. It can be shown that in this case:

$$\frac{\partial N_a}{\partial K} \sim K^{r-1}$$

that is, response of the demand for activists to changes in investment become less pronounced with the accumulation of capital. As long as the economy is saturated with activists, we expect only a minor effect of economic development on recruitment.\textsuperscript{13} To the contrary, there should be a positive feedback between investment and party growth under a “young” one-party regime ($AL << K$), given sufficiently low elasticity of substitution ($\rho < -0.5$):

$$\frac{\partial N_a}{\partial K} \sim K^{-2r-1}$$

Following the same procedure, we can derive and analyze $\frac{\partial N_a}{\partial L}$. It is convenient to relate it to $\frac{\partial N_a}{\partial K}$:

$$\frac{\partial N_a}{\partial L} = -\left(\frac{K}{L}\right) \frac{\partial N_a}{\partial K}$$

Therefore, in an economy at a low level of development (low capital-labor ratio), the response of demand for activists to the changes in labor inputs has a lower magnitude and opposite sign as compared to the response to investment.

### 2.3. Political regime and enforceability of promotion contract

The major problem with the implicit contract between the incumbent bosses and the activists is its time inconsistency. The contract benefits both parties at the time of signing as long as the participation constraints is met. However, the bosses have an incentive to renegotiate the contract at the time it reaches maturity if expected regime stability, reflected in $T_m$, is high and therefore the

\textsuperscript{12} Easterly and Fisher (1995) show that the Soviet economic growth is consistent with the elasticity of substitution of around 0.4, which is equivalent to $\rho = -1.5$. Low elasticity of substitution is considered by these and some other authors as a major cause of the Soviet economic slowdown (see a recent discussion of this subject in Gorban et al. 2001). However, less-than-unitary elasticity per se (negative $\rho$) is not rare. It has been identified, for example, for the U.S. and South Korean economies (Yuhn 1992).

\textsuperscript{13} Noteworthy, this result holds true unconditionally, since $\rho$ is less than unity by the definition of CES production function.
bosses expect significant loss of rents due to retirement. The activists may or may not accept renegotiation. At a first glance, they are facing a take-it-or-leave-it choice and, since their past services are sunk costs that should have no impact on the activists’ decisions made at time $T_a$, they are better off accepting revised contract. In the reality, however, the cheated activists are likely to demand “justice,” and the bosses’ ability to coerce rebelling activists into submission is crucial in determining how far the bosses can go in breaking the contracts.

Breach of contract can take one of the two forms. First, the bosses can promote a lower share of activists than the latter expected. Second, the bosses can stay in office longer and increase the activists’ term of service correspondingly. In both cases, promotion rate, $\pi/T_a$, falls and boss tenure, $T_b$, increases. The bosses are strictly better off in the short run. Immediate effect of these changes on the supply of activists is positive if the effect of longer tenure exceeds that of decreasing turnover. However, repeated breaches of contract should make the prospective activists understand that the tenures of the incumbents are growing at the expense of the future cohort of bosses. Moreover, the activists, once cheated, tend to extend the tenures further when they finally get promotion. This shifts the supply of activists downwards. Since the demand for activists increases in tenure, the system goes out of equilibrium (Fig. 7). The bosses can mitigate the problem by offering easier terms of services for new activists (lower $a$ causes the supply curve to shift upwards), but this implies lower rents per capita. Keeping the rents at the current level calls for either a reduction in the number of bosses or debt financing, a “Ponzi scheme.” The former strategy leads to a gradual contraction in both the number of activists and the number of bosses. In the latter case, new boss positions, created for the activists whose contracts reach maturity, are paid for by hiring yet larger number of new activists. This strategy works only for a short period of time, after which either contraction resumes or revolution breaks out. Under both scenarios, tenures are growing and the system reaches eventually

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14 A contract “signed” during hard times (uprising, war, etc.), when expectation of $T_m$ goes down momentarily and the demand for activists experiences additional upward shift, is most likely to be renegotiated. As soon as the power is restored “normal” $T_m$ rebounds and a downward revision of promotion rate can take a form of massive purge of excess activists. This happened in the Soviet Union after the end of the forced collectivization of peasantry (1929-33) and after the World War II.

15 Empirical and experimental research in behavioral economics shows that sunk costs do influence decisions profoundly in the situations similar to the described one. This effect is often explained with a reference to the notion of fairness (Joll et al. 1998).
the bosses’ participation constraint. At this point the bosses choose not to renew promotion contract because the returns from activists’ services are no longer sufficient to justify early retirement. It is rational for the bosses to start a transition toward a political-economic organization based on secure private property.

The prevailing type of contract violation and, consequently, the pattern of change in a one-party system is a function of the political regime the bureaucracy chooses. This choice is largely determined by exogenous factors that influence the bosses’ ability to collect rents (“productivity” in coercion or corruption) and, in its turn, influences this ability. It is not beneficial for the bureaucracy as a whole to deviate from the long-run equilibrium terms of promotion contract. At the same time, it does not pay for any particular boss with a narrow interest to keep the promise to retire, especially for one who is near the end of tenure. The benefit from staying one more year in office is greater than the immediate loss from the shrinking supply of activist services that ensues. Therefore, the key factor that prompts contract violation is the free-riding among bureaucracy, and its senior members in particular. The free-rider problem can be mitigated by entrusting dictatorial power to a member of the bureaucracy with an encompassing interest. The dictator would be able then to use this power to enforce contract compliance, i.e. to force the bosses into retirement as they reach the announced terminus of tenure. Dictatorship coordinates the bureaucracy more effectively than a looser oligarchic rule, thus increasing total revenue and per capita rents. Finally, the dictator as a “stationary bandit” in the sense introduced in Olson (1993) is capable of maintaining a system of orderly distribution of benefits that prevents wasteful competitive rent seeking within the bureaucracy.

However beneficial for the bureaucratic rule, absolute dictatorial rule imposes additional costs on the bosses. Dictators by definition cannot be controlled, and one can become a “disloyal patron” to the bureaucracy, as Joseph Stalin did in the late 1930s (Rigby 1990). For these reasons, a dictatorial solution is more likely to emerge when a high level of coordination is a vital necessity for the survival of a regime and when it depends crucially on activist services: during or on the eve of a war or an uprising; and/or in poorer societies when development challenges call for massive investment. To the contrary, the lower the threat to the bureaucratic rule and the more productive the economy, the more

---

16 If the bureaucracy is a multi-layered hierarchy, as it really is, its higher-ranking officials have better chances to overstay in office, because they are protected from the pressure from below by intermediate levels, and the smaller size of higher layers makes it easier to establish mutual-protection networks. Formation of cliques causes the “clogging” of promotion channels. Therefore, hierarchy effects an additional deceleration of job mobility.

17 Although this process has nothing to do with the economic performance, the movement is in the same direction as one caused by accelerating economic growth.
readily the bosses choose an oligarchic regime with less coordination and less rigorous contract enforcement. When this happens, one-party regime sets on the course toward its abolition.

3. Data and results

The dataset we use to test our model pertains to the period of 1956-1968, coincides approximately with one full wave of the Soviet political business cycle. It starts in the aftermath of the regime change that occurred after the death of Stalin in 1953, and is characterized with rebounding influx of activists (increasing numbers of admission of candidates to the party) after a trough of the mid-1950s. This expansionary trend reverted after 1965, which coincidentally (?) was the first year of a new regime. In October 1964 Khrushchev was replaced by Brezhnev as the party leader. Economic development of the period is characterized by high rates of growth and active investment policy, although the sub-period of the early 1960s is marked by a slowdown. Some of the data are proxies, and we have to present first a review of institutional facts that help interpret available data correctly.

3.1. Institutional facts

Hierarchy. Soviet communist party hierarchy was almost an exact match to the hierarchy of administrative (territorial) units. The latter include (top down): Union, republic, oblast, district/independent city/urban district, primary part organization (PPO). Russian republic had no separate party structure, its oblasts administrations reporting directly to the union government and oblast party committees directly to the party Central Committee. “Independent city” is a relatively large city subordinated directly to oblast and is not affiliated with any district. Urban districts existed only in large cities and were comparable in population to rural districts and most ordinary independent cities. PPOs were typically associated with industrial enterprises. Most primary party organizations had no paid officials on top. Secretaries of PPOs were paid only in the largest enterprises.

Administrative (territorial) structure was subject to permanent reshuffling. Districts were split and merged every year; independent status could be given to a city and withdrawn a year after. These changes translated automatically into creation and destruction of party bodies and changes in the number of paid positions for party officials, i.e. the number of bosses in terms of our model.

Party membership. The rules of the Soviet Communist party (as in other communist countries, e.g. China) assumed trial period for new members. During this time, new party recruits were titled candidates. Upon passing the candidate review successfully, they were becoming full party members. Candidates were subject to close scrutiny that reflected in the expulsion rate that was by one order of magnitude higher among them than among full members, 3% and 0.3% per year respectively in 1959-
1961. Still both rates were not high enough to influence the dynamics of party membership significantly.

**Benefits of party membership.** Party membership was normally a prerequisite for appointment to a top managerial position in all spheres of the economy or for pursuing a career in government: civil administration, economic control, or party. A position of a “leading party worker” (party bureaucrat) was of the utmost importance. There is no indication that party membership per se did pay, so that the party *in toto* can be equated to the privileged stratum of the society. Observed wage differentials are due to disproportionately high representation of white-collar workers in party, around 50% in the late 1950s, although declining over time.\(^{18}\)

Party bureaucracy did receive substantial rents in the form of high salaries and fringe benefits. Major part of party organizations expenditure, according to national party budgets (RGASPI), was geared to provide benefits to paid party officials, the remainder being used to cover operational expenses and to finance propaganda campaigns. Salaries of paid party officials were only a minor portion of their rents. Fringe benefits (health and child care subsidies, relocation packages, etc.) and non-monetary rewards, such as free housing financed from party budgets, constituted a more significant part of their real incomes.

**Personnel policy.** All appointments to the positions of responsibility were controlled by party committees on union, republican, and oblast levels. Administrators were formally subject to the same age ceilings as general working population. However, there is no indication that formal rules were ever applied to high ranking party officials. Therefore, there were no institutional obstacles to retirement procrastination.

### 3.2. Available data

**Party membership.** Numbers of candidates and full members are available on the national level for the whole period of the existence of the Soviet communist party. Republican level data are available for 1956-1968 (UFFA). Significant lacunas in the time series restrict our dataset to only nine republics: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Latvia, Tajikistan, Turkmenistan, and Uzbekistan. In post-Stalin years, candidate trial period was close to one year, so the number of candidates for a given year equals approximately the number of new activists.

**National party budgets,** available from archival sources (RGASPI), record total expenditures of the Central Committee (actually, including a number of affiliated central bodies) and territorial organizations. The latter are the aggregate numbers for all administrative units below the national

\(^{18}\) UFFA reports 25% party premium in 1970; our calculations based on the archival data on party dues for 1962 yield 15-20%.
level. Breakdown by particular republics and oblasts are available only for 1962 and 1964. No data for lower-level units are available.

Party bureaucrats. Numbers of bureaucratic positions and salaries are available for most years from 1940 to 1965 separately for each hierarchical level. Breakdowns by republic are available for 1950, 1962, and 1964. Comparison of national aggregates of party payrolls and total expenditure by territorial party organizations shows that payrolls constituted an almost fixed percentage of party budgets: $5.8 \pm 0.3\%$ in 1955-65. Since no budget data on units below the national level is available, we use the data on salaries (averages by republic and by level in the hierarchy) as a proxy for bureaucratic earnings/rents. The same sources provide office size data (the number of bosses per administrative unit).

Salaries vary significantly (30%) with the level in the hierarchy but exhibit very low variation across republics – 2-3% within each hierarchical level. Therefore, territorial structure of a republic (numbers units of each level) is likely the most important determinant of variations in the party payroll and, consequently, average salaries by republics.

Anecdotal evidence suggests that illicit incomes of corrupt officials might have been significant. However, no reliable data on the extent of corruption is available. Therefore, we have to ignore this phenomenon altogether.

No precise data is available on party bureaucrats’ tenures. Common wisdom is that Khrushev’s period (1953-1964) was characterized with relatively high mobility, while subsequent period was marked by turnover slowdown.

Territorial structure data is available from published sources (*Narodnoe khoziaistvo SSSR*) for 1956-1968 (as well as later years) for every republic in the sample.

Demographic and economic data are available from published sources, mostly from annual statistical compilations (*Narodnoe khoziaistvo SSSR*). All nine republics in the sample are relatively small and homogenous culturally and economically. The largest republics are Uzbekistan and Belarus (population around 8 million, in 1959); the smallest republic is Estonia (population just below 1 million).

We use the following data series: population; labor force (equal to employment due to absence of official unemployment in the USSR; does not include employed in largely subsistence collective farms, around 1/5 of total labor force); indices of industrial output; investment by state organizations (this includes industrial enterprises) in current rubles; retail sales; and three two indicators of public goods production – enrollment in higher education institutions, new public housing construction (square meters), and physicians per capita.
Retail sales is a replacement for real wages in our case. Nominal wages are not indicative because of price distortions, pervasive shortages in consumer markets and forced savings that were typical for the Soviet economy. In the absence of virtually any opportunity for private investment and public provision of most services at symbolic prices, retail sales per worker is a relatively accurate proxy for personal disposable income. Price indices are also available from official publications but they apparently serve solely the propagandistic purpose of demonstrating continuous increase in real incomes. Another measure of price variation can be obtained indirectly by relating so called physical volumes of trade with sales in nominal rubles. These data series do reveal inflation during certain periods, in particular during the slowdown of the early 1960s. However, indices thus obtained still show low variation in prices across time and are incomparable across republics. Therefore, we chose not to use these indices, restricting ourselves to sales in nominal rubles.

We also use enrollment in higher education institutions as a proxy for opportunities to pursue a non-party professional career leading to higher earnings. Because all education was free of charge, demand for college education (number of applicants) typically exceeded admission. Therefore, total enrollment is equivalent to the number of “promotion tickets” available to the population outside of the party promotion machine. Although party membership was a plus for an applicant, it was not a prerequisite for admission and higher education is therefore an distinct alternative to activist service.

3.3. Reconstruction of missing data

To test our model, we need data on the number of paid party positions (the number of bosses) and their salaries for each republic for each year. Complete cross-tabulations of this sort are available only for one year – 1962. In addition, the numbers of bosses and their average salaries by republic (without separation into hierarchical levels) are available for 1964. Our approach is based on the assumption that changes in territorial structure is the major source of changes both in the number of bosses (due to change in the total number of units) and in average salaries (due to change in the hierarchical level mix). An advantage of this approach is that it relies on the data on territorial structure that are easily verifiable and hardly could be subject to any deliberate distortion unlike many other series of policy-related data.

We use two methods to impute missing salary and party bureaucracy size data. Under the first method, assuming constant republican differentials in pay and office size (the number of bosses per unit) by level (from 1962 data) and applying common trend in these variables (from the national data), we calculate the numbers for each level for each republic and aggregate them to obtain republican average salaries and the total numbers of bosses. The second method is to regress average republican salary and office size data for 1962 and 1964 against territorial structure data and national averages for these years, and use predictions of these models. The numbers of PPOs and the salaries of their
personnel exhibit relatively high variation across republics and is strongly correlated with the total number of urban settlements by republic. Moreover, higher numbers of these units and salaries are characteristic for more urbanized and industrial republics. For these reasons, we use common “all cities” variable as well as republic-specific coefficients in our regressions. Regression models for imputing salaries and boss numbers are reported in Table 1. Aggregate dynamics calculated on the basis of thus imputed salaries and boss numbers is in good agreement with national trends with the exception of 1958 when two largest republics in the sample, Belarus and Uzbekistan, underwent territorial reorganization unmatched in its scale in the rest of the country.

3.4. Estimation strategy and results

Our model allows certain predictions to be made with respect to the variables in the Soviet dataset. Following the logic of the model, the dependent variable is the share of new candidates (activists) in the labor force. A more accurate approach would be to take into account only that part of labor force, from which the vast majority of new candidates were recruited: males in mid-twenties to late thirties. Because of the absence of detailed age distribution data, we use the total labor force. The supply equation suggests negative effect of wage and positive effect of average boss salary. In the absence of systematic data on tenures and promotion rate, ratio of the bosses to the full party members is a proxy for a priori probability of promotion (in assumption of stationary regime defined by (9)). This ratio should have a positive effect. The demand side of the model predicts positive correlation between candidates and investment, and negative correlations with labor force and output.

In addition to the variables that enter our model explicitly, we use enrollment in the institutions of higher education as an indicator of availability of alternatives to party careers. This variable should have a negative effect on the number of candidates. We also expect negative effects of the two above mentioned indicators of public consumption (for the same reasons as we expect negative effect of wages). Finally, we add population growth rate which should have a negative effect, since it reduces per capita consumption.

Predictions of our promotion contract model provide a stark contrast to what “loyalty purchase” model would suggest. If the latter is true and the dictator’s subjects supply their loyalty in appreciation of his benevolent policies, we should expect to see positive effects of the proxies for private and public consumption: wages, physicians per capita, new housing, and higher education enrollment. Party and economic policy variables should have no direct effect. Predictions of the two models are juxtaposed in Table 2.

We estimate our model using first-order log differences to exclude common trend effects. Dependent variable in the regression is the log difference of the absolute number of candidates. Since model predictions concern candidates as a share of labor force, wage (retail sales per worker), and
enrollment, the coefficient at labor force variable is a composite of three effects. Net effect of labor force in the regression is given by:  \( \beta_{NL} = \beta_L + \beta_E + \beta_R - I \), where three betas on the right-hand side are the coefficients at labor, enrollment, and retail sales, respectively, obtained from the regression.

To avoid making any strong assumptions about error structure of the modeled process, we use a feasible GLS specification with White heteroskedasticity consistent covariances. To capture the effects of unaccounted parameters of the processes, we use republican fixed effects. It would be natural to hypothesize the existence of contemporaneous correlation across cross-sections due to the common effect of policy changes dictated by the central government. However, the number of observations is too small to test the data for this feature.

The results of estimation are reported in Table 3. Most coefficients are in accordance with the predictions of the promotion contract model. Negative or insignificant coefficients of welfare variables reject “loyalty purchase” model definitively. A distinctive feature of the results is the high significance of negative stimuli to join party (coefficients at retail sales, enrollment in higher education, full party membership) and low significance of positive ones (the number of bosses and their average salary). Part of the explanation is the error inherent in imputation of corresponding data series. Additionally, neither the ratio of the bosses to the full party members captures chances for promotion completely nor salary is a comprehensive measure of the bureaucratic rents. Moreover, these variables were far from perfectly observable for the workers considering the choice to become activists. The information on the number of positions in the party bureaucracy and the bosses’ salaries and benefits was never publicized. It could be acquired from indirect sources, and transmitted by the word of mouth. Finally, positions and salaries of bureaucrats are generally better protected from the twists of economic fortune than private and public consumption of ordinary workers. Therefore, it is quite reasonable that positive incentives to seek bureaucratic careers (“pull”) have less significant effect than negative incentives (“push”) in any institutional setting.

We cannot identify specific effects of shifts in the demand and supply of activist services, because some factors affect both in the same direction (see Table 2). Demand-specific factors – investment and output – have predicted signs, although significance of output is low. Noteworthy, the net effect of labor input is virtually zero, while investment has a strong positive effect. Technically, this should imply very low capital/labor ratios in the economies in the sample. This is not implausible, given that only two republics, Latvia and Estonia, had relatively advanced industrial economies.

\[19\text{ We found that boss variables imputed using two methods described earlier produce similar results, although the second method produces systematically coefficients of higher levels of significance. Therefore, we report only the results from estimations that rely on the second method.} \]
However, there is also an unaccounted positive effect of labor force on the number of candidates. In the USSR, where unemployment was not recognized, an increase in labor force ceteris paribus is equivalent to lower unemployment and, consequently, higher per capita wage incomes. This should diminish incentives to seek party careers. Although we do not model this factor explicitly, it is consistent with the logic of our model.

Most fixed effects in the model have low significance. However, the magnitudes of the effects are roughly clustered by region, higher coefficients being characteristic of three western republics, lower for three Caucasian republics, and the lowest for Central Asia. In an attempt to reveal significant regional differences, we run a variant of our regression model with only regional fixed effects included. The results reported in Table 4 show that there are significant regional differences. Significant positive effect of western region makes sense if we take into account that most of this area had been incorporated in the Soviet Union only a decade before the period of our analysis. Party dynamics there could be that of expansionary movement towards the equilibrium rather than a quasi-stationary one. As we show in the next section, this type of development is also observable in the Soviet Union on the whole in the earlier decades. Noteworthy, all three western republics, leaders in activist recruitment in the beginning of the period, slide down towards average recruitment rates by the end of the period.

4. Discussion: Life-cycle of a one-party regime

Our model obtained considerable support from the estimation of panel data from a narrow time period. The next would be its application to the Soviet political-economic dynamics in the long run. A major obstacle to doing this is the lack of consistent and reliable time series for some of the relevant indicators. Although consistent data on the most significant demand factor, investment, are available for the whole period of Soviet history, there are significant lacunas on the supply side. In particular, information on the party bureaucracy is restricted to irregular and probably incomparable observations separated by years or decades. Therefore, we are unable to perform accurate testing of our model in the long run. We restrict our discussion here to stylized facts and their interpretation.

Available data on administrative employment and salaries of administrative employees in conjunction with the data on total employment and average wages give some idea of trends in factors influencing the supply of activists. Although employees in administrative sector are not synonymous to the bosses in terms of our model, data on this occupational group is likely to reflect general trends in the size of the bureaucracy and bureaucratic rents. We use these data to construct a single indicator that captures both positive and negative incentives for a potential party entrant. This indicator, expected rent, $R^e$, is the product of administrative wage premium (ratio of average salary in
administration, \( W_a \), to the average nominal wage in the economy, \( W \) and the a priori probability of promotion. The only reasonable proxy for the latter in longitudinal national data is the ratio of administrative sector employment, \( E_a \), to the full party membership, \( P \). Thus:

\[
R^* = \frac{W_a}{W} \left( \frac{E_a}{P} \right)
\]

Expected rent approximates the argument of \( Z(\cdot) \) in the supply of activists equation (3) up to a linear transformation and is, therefore, an aggregate supply indicator.

Fig. 8 displays the dynamics of candidate recruitment against major indicators of the supply and demand for activists – expected rent and investment rate, respectively. It can be observed that movements of index number of candidates per labor force correspond largely to those of investment index. The major exception is the years of WW II and its aftermath, when activists were needed primarily in the army, not in the economy.\(^{20}\) Variation of expected rent is lower and its relationship to activist recruitment is less apparent. However, the period of the largest increase of expected rent in 1930-1933 coincides with the period of the fast increase in candidate/labor ratio.\(^{21}\) The remaining five decades of bureaucratic rule are characterized by downward trends in both candidates and expected rents. The latter is mostly due to gradual increase in general wages. The last five years of the regime - Gorbachev’s period - is a notable exception: candidates and expected rents set onto diverging trajectories. Declining investment rates since the early 1970s, resulting from diminishing returns to public investment,\(^{22}\) depressed the demand for activists. At the same time, retirement protraction should have outweighed increase in expected rents.

Although we have no systematic data on tenures and turnover rates, we know that upper tiers of the bureaucracy were purged three times in the first forty years of the regime: in 1929-30, when Stalin came to power, in 1937-38 (the Great Terror), and in mid-1950s after Stalin’s death. Each of these episodes (marked with vertical bars in Fig. 8) was preceded by 3-7 years of dramatically declining rates of promotion to full party membership, signaling breach of contract by party bureaucracy. In all

\(^{20}\) Correlation between the two series in the post-war period should be higher, since the equipment removed from defeated Germany as reparations is probably not accounted for in the data.

\(^{21}\) Full party membership did not exceed administrative sector employment until mid-1930s. Prior to that we assume the probability of promotion to be equal one. Anecdotal evidence suggests that this is historically accurate: full party membership gave an unconditional right to fill an administrative or managerial position. The head of the central party committee party reckons in 1936: “One who has a party membership card can enter <any office>. Once in there, he would demand a job…” and get an appointment even he has a criminal record. (RGANI.6.1.15.37)

\(^{22}\) Gorbachev’s reforms aimed at giving autonomy to state enterprises can be considered as an indication of declining interest of the ruling bureaucracy in public investment. On the causes of the declining Soviet economic growth, see Easterly and Fisher (1995), Gorban et. al (2001).
three cases, dictatorship was able to enforce promotion contracts and reinvigorate candidate recruitment. On the average, bureaucratic tenures in this period could rarely exceed two decades and often ended with demotion, imprisonment, or even death. With Khrushchev’s removal in 1964, Soviet bureaucracy dropped out of dictatorship thus gaining security from its excesses, but the new oligarchic regime was unable to enforce promotion contract. Upward mobility, especially into the bureaucratic elite, became notoriously low in the 1970s (Clark 1989, Farmer 1992). Top bureaucratic positions were occupied in the early 1980s by people who entered the ranks of bosses in the late 1930s and 1940s. Thus boss tenures had grown up to approximately four decades. The reverse side of this was increasing expectations of length of service for the activists enrolled in 1970s or considering joining the party in 1980s. Given the long and growing queue of activists, chances of promotion became virtually zero. Attempts to solve the problem of shortage of activist by offering them more relaxed service requirements led only to faster accumulation of overdue debt represented by steadily increasing party membership (Fig. 1).

There were apparently certain concerns within the bureaucratic elite by the mid-1980s about the regime setting on an unsustainable trajectory. The last party General Secretaries, Yuri Andropov in 1982-84 and Mikhail Gorbachev since 1985, restarted the practice of forcing high-ranking party bureaucrats into retirement. These activities reached the highest point by the late 1980s. They must have become scarily similar to the Great Terror for the bosses, causing their growing discontent that eventually erupted in an abortive putch in August 1991. The main beneficiaries of the acceleration of bureaucratic mobility under Gorbachev were “young cadres” in their forties and fifties who had been

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23 The assessment of the Great Terror, widely accepted in the literature, is that it was Stalin’s attempt to dispense with his political enemies. A number of facts suggests, however, that the main objective of the Great Terror was to promote the activists, many of whom had been waiting for promotion for about a decade. First, there is no clear pattern in the incidence of Terror, except for the hierarchical rank of a victim. Second, the primary engine of turnover was “Party democracy” that allowed rank-and-file party members to criticize their bosses and nominate candidates to replace them. A recurrent theme in the party press of that time – blaming uncovered “enemies of the people” in the regional party committees for obstructing promotion of “young cadres” – is consistent with the “democratization” drive of the Terror and its purpose to revitalize promotion. Third, most accusations in 1937-1938 belong to an abstract “enemy of the people” category, indicative of the indifference about the crimes of ousted bosses. To the contrary, corruption and mismanagement accounted for a substantial share of expulsions from the party and almost one half of all dismissals of regional party administrators in the earlier period. Thus the Terror was not Stalin’s crackdown upon his political enemies and/or inept administrators and managers. Finally, the end of the Terror in early 1939 coincided with a huge financial injection that almost doubled local party budgets and office sizes. (RGASPI.17.75.1.1-12.) This latter fact can be interpreted as a massive repayment of overdue debt to the activists that was sufficient to restore peace between the bosses and the activists.
stuck in mid-rank positions for a decade or more. In the oversized party, this moderate increase had little impact on recent recruits. At the same time, introduction of the freedom of small enterprise and abolition of restrictions on the size of salaries in the state sector of the economy opened new and potentially lucrative outside option for activists. The supply of activists fell to the point where the incumbent bosses were no longer interested in maintaining the contract.

Although the reduction in the number of activists in 1987-90 was moderate in comparison to some earlier periods, it was sufficient for the system to reach quickly its lower boundary - the bosses participation constraint. At the same time, the bureaucracy itself got an outside option. The end of the Cold War gave it new sources of rents associated with international credit and international trade. It also reduced the burden of military spending. Therefore, the ruling bureaucracy experienced a positive income shock that increased its rents, even though the rates of economic growth in the USSR were low and falling.\footnote{It is tempting to hypothesize that if the same opportunities had opened in mid-1950s - the earlier period of dramatic decline in the number of activists - the Soviet Union would have been ancient history by now.} Given the proximity of the participation constraint, the new sources of rents, even if minor and transitory, were sufficient to cross it over. It would be an exaggeration to say that the end of the Soviet regime was absolutely smooth and welcome by everyone. Yet, relative ease of radical institutional change in the country with enormous army and secret police, and a tradition of ruthless political repression, makes it clear that no significant economic interests remained in favor of renewal of the contract.

Subsequent political democratization and privatization was a natural and probably the only feasible transition solution. It auctioned off state property and most bureaucratic positions in a quasi-competitive way that was acceptable for both the bosses and the activists. On the one hand, it allowed the Soviet bureaucrats, who had the incumbency advantage in the privatization process (Alexeev 1999), to convert their \textit{ex officio} control rights into legally protected private property rights. On the other hand, it gave a chance of “promotion” into entrepreneurs to a part of the population most actively seeking opportunities for upward mobility. All in all, the old bureaucracy won the privatization match scoring two to one: by the mid 1990s, after the end of mass privatization and the first phase of democratic transition, former nomenklatura appointees accounted for about two thirds of the top positions in Russian business and government.\footnote{More data can be found in Lazarev (2001).} A majority retained old positions or occupied similar ones; many moved across institutional boundaries. The new elite has the same face as the earlier ruling bureaucracy, but it has got a new personality. It is no longer a collective owner of
the country and has neither the ability nor the need to borrow activist services through promotion contracts.

4. Concluding remarks

Research presented in this paper offers a new perspective on the economic foundations of non-democratic regimes and the conditions of their sustainability. Instead of representing a non-democratic regime as a personal dictatorship, we focus on the processes within the ruling bureaucracies. Control of promotion into and within the bureaucracy under a one-party regime allows the bureaucrats to raise additional rents by exchanging “promotion tickets” for the voluntary services of the activists, aspirants to the rent-paying positions. In the Soviet Union, as well as in the other socialist countries, the nomenklatura system of appointment implemented such a mechanism. An implicit contract underlying the exchange between workers and the ruling bureaucracy provides participation incentives for both. Workers achieve higher incomes and bureaucrats increase their rents due to the effort-eliciting supervisory services of activists. Efficiency of this exchange is a function of the income gap between workers and bureaucrats, but it also depends on production technology. Activists’ supervisory service is essentially a labor-augmenting technology. In an economy with low elasticity of substitution between labor and capital, this produces a positive correlation between the bureaucrats’ demand for activists and public investment. This correlation declines with capital accumulation.

Our model generates certain predictions about relationships between political and economic variables. Econometric analysis of panel data from the former Soviet Union yields results that are largely consistent with these predictions. In part, our results reconfirm earlier findings by Schnytzer and Sustersic (1998) for former Yugoslavia. The essence of this finding is that the lower are wages and employment, the higher is the supply of activists, as revealed in party recruitment rates. In other words: the worse for the country the better for the bureaucracy. However, our study shows that the demand factors are also significant determinants of regime dynamics. We find strong correlation between public investment and the number of activists. There is also an indication of negative effect of economic growth on party recruitment, which is contrary to the earlier findings, but consistent with our model.

The cost of the promotion contract for the bureaucrats, which is their limited tenure, can offset its benefits. Bureaucrats seek to renegotiate the contract in order to capture additional rents, probably at the expense of long-term stability of the regime. The implicit promotion contract is not self-enforcing, and dictatorship is necessary to keep the regime dynamics on a quasi-stationary path. However, in the absence of an extreme threat to the regime, the costs borne by individual bureaucrats
under dictatorial rule are excessive, and they choose oligarchic rule. The latter is unable to keep the tenures of incumbents from rising, and the contract eventually ceases to be beneficial for both potential activists and the bureaucracy. Once this happens, the bureaucracy abandons collective proprietorship and hierarchical organization, since these are merely the instruments that facilitate borrowing of services and political support from activists. Soviet stylized facts are consistent with this theoretical scenario.

Our model conforms political-economic dynamics of the Soviet regime and suggests an explanation of its peaceful end in 1991 as the choice of its ruling bureaucracy “approved” by the workers. The model can be applied to other non-democratic regimes, most readily to China, which is a typical example of one-party rule and economic power of the bureaucracy. Upon availability of appropriate political and economic data, we can analyze the direction and the rate of change in the parameters of contracts underpinning bureaucratic control and possibly predict the transition to competitive political and economic markets.
References


**Data sources**


RGASPI (Russian State Archive of Socio-Political Information). *Fond 17 (Central Committee of the Communist Party of the Soviet Union): Opis 7 (Statistical department), Opis 75 (Finance department)*. Hoover/Chadwick-Healey. Soviet State and Party Archives Microfilm Series.


### Tables

Table 1a. Regression model for boss salaries.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>p-level</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0.3416</td>
<td>0.0005</td>
</tr>
<tr>
<td>INDEPENDENT_CITY</td>
<td>0.5523</td>
<td>0.0610</td>
<td>(0)</td>
</tr>
<tr>
<td>SALARY_NATIONAL</td>
<td>0.9226</td>
<td>0.0172</td>
<td>(0)</td>
</tr>
<tr>
<td>URBAN_DISTRICT</td>
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<td>0.3155</td>
<td>0.0001</td>
</tr>
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<td>ALL_CITIES</td>
<td>-0.4402</td>
<td>0.1466</td>
<td>0.0199</td>
</tr>
<tr>
<td>ALL_CITIES*AZERBAI</td>
<td>-0.2294</td>
<td>0.0784</td>
<td>0.0222</td>
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<tr>
<td>ALL_CITIES*BELARUS</td>
<td>-0.2633</td>
<td>0.1068</td>
<td>0.0433</td>
</tr>
<tr>
<td>ALL_CITIES*ESTONIA</td>
<td>0.3361</td>
<td>0.0753</td>
<td>0.0029</td>
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<td>ALL_CITIES*GEORGIA</td>
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<td>0.0070</td>
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<td>ALL_CITIES*LATVIA</td>
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</tr>
<tr>
<td>ALL_CITIES*UZBEK</td>
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<td>0.1269</td>
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R² = 0.9867

Table 1b. Regression model for the number of bosses.

<table>
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<th>Std. Error</th>
<th>p-level</th>
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<tr>
<td>BOSSES_NATIONAL</td>
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<td>0.0009</td>
<td>(0)</td>
</tr>
<tr>
<td>ALL_CITIES</td>
<td>-11.4004</td>
<td>4.7940</td>
<td>0.0414</td>
</tr>
<tr>
<td>ALL_CITIES*AZERBAI</td>
<td>21.4338</td>
<td>3.2951</td>
<td>0.0001</td>
</tr>
<tr>
<td>ALL_CITIES*BELARUS</td>
<td>36.5713</td>
<td>4.2045</td>
<td>(0)</td>
</tr>
<tr>
<td>ALL_CITIES*ESTONIA</td>
<td>8.1200</td>
<td>2.5207</td>
<td>0.0105</td>
</tr>
<tr>
<td>ALL_CITIES*GEORGIA</td>
<td>20.9038</td>
<td>3.1715</td>
<td>0.0001</td>
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<tr>
<td>ALL_CITIES*LATVIA</td>
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<td>3.3752</td>
<td>0.0019</td>
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<td>ALL_CITIES*UZBEK</td>
<td>47.8951</td>
<td>3.7113</td>
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R² = 0.9988
Table 2. Expected effects in promotion contract and “loyalty purchase” models.

<table>
<thead>
<tr>
<th>Variable</th>
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<th>Loyalty purchase</th>
</tr>
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<tr>
<td></td>
<td>Supply</td>
<td>Demand</td>
</tr>
<tr>
<td>Number of bosses</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Full party members</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Average boss salary</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Labor force, net effect</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Retail sales</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Students</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Physicians per capita</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Investment</td>
<td>0</td>
<td>+</td>
</tr>
<tr>
<td>New housing</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Population growth rate</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Industrial output</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>
Table 3. Estimation results with republican fixed effects.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. error</th>
<th>t-statistic</th>
<th>p-level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of bosses</td>
<td>0.274</td>
<td>0.212</td>
<td>1.292</td>
<td>0.200</td>
</tr>
<tr>
<td>Full party membership</td>
<td>-0.021</td>
<td>0.012</td>
<td>-1.797</td>
<td>0.076</td>
</tr>
<tr>
<td>Average salary</td>
<td>0.166</td>
<td>0.399</td>
<td>0.416</td>
<td>0.679</td>
</tr>
<tr>
<td>Labor force</td>
<td>2.179</td>
<td>0.870</td>
<td>2.504</td>
<td>0.014</td>
</tr>
<tr>
<td>Labor force (net effect)</td>
<td>-0.510</td>
<td>1.019</td>
<td>-0.501</td>
<td>0.618</td>
</tr>
<tr>
<td>Retail sales</td>
<td>-1.213</td>
<td>0.494</td>
<td>-2.456</td>
<td>0.016</td>
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<tr>
<td>High ed. enrollment</td>
<td>-0.476</td>
<td>0.275</td>
<td>-1.735</td>
<td>0.087</td>
</tr>
<tr>
<td>Physicians per capita</td>
<td>-1.409</td>
<td>0.701</td>
<td>-2.009</td>
<td>0.048</td>
</tr>
<tr>
<td>Investment</td>
<td>1.020</td>
<td>0.322</td>
<td>3.169</td>
<td>0.002</td>
</tr>
<tr>
<td>New housing</td>
<td>-0.050</td>
<td>0.140</td>
<td>-0.360</td>
<td>0.720</td>
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<tr>
<td>Population growth rate</td>
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<td>1.248</td>
<td>-1.994</td>
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<tr>
<td>Industrial output</td>
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<td>0.675</td>
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<tr>
<td>Armenia</td>
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<td>0.110</td>
<td>1.023</td>
<td>0.310</td>
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<tr>
<td>Azerbaijan</td>
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<td>0.173</td>
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<tr>
<td>Belarus</td>
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<td>0.114</td>
<td>1.357</td>
<td>0.179</td>
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<tr>
<td>Estonia</td>
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<td>0.062</td>
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<td>Georgia</td>
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<td>0.090</td>
<td>0.925</td>
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<tr>
<td>Latvia</td>
<td>0.141</td>
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<td>0.145</td>
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<tr>
<td>Tajikistan</td>
<td>0.075</td>
<td>0.101</td>
<td>0.750</td>
<td>0.455</td>
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<tr>
<td>Turkmenistan</td>
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<td>0.080</td>
<td>0.978</td>
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<tr>
<td>Uzbekistan</td>
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<td>0.107</td>
<td>0.779</td>
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<tr>
<td>$R^2$</td>
<td>0.400</td>
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F-statistic: 2.770
Table 4. Estimation results with regional dummy variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. error</th>
<th>t-statistic</th>
<th>p-level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of bosses</td>
<td>0.244</td>
<td>0.197</td>
<td>1.241</td>
<td>0.218</td>
</tr>
<tr>
<td>Full party membership</td>
<td>-0.020</td>
<td>0.012</td>
<td>-1.709</td>
<td>0.091</td>
</tr>
<tr>
<td>Average salary</td>
<td>0.153</td>
<td>0.331</td>
<td>0.463</td>
<td>0.644</td>
</tr>
<tr>
<td>Labor force</td>
<td>2.197</td>
<td>0.741</td>
<td>2.963</td>
<td>0.004</td>
</tr>
<tr>
<td>Labor force (net effect)</td>
<td>-0.427</td>
<td>0.870</td>
<td>-0.491</td>
<td>0.625</td>
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<td>Retail sales</td>
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</tr>
<tr>
<td>Physicians per capita</td>
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<td>Investment</td>
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</tr>
<tr>
<td>New housing</td>
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<td>0.043</td>
</tr>
<tr>
<td>Industrial output</td>
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<td>0.662</td>
<td>-1.439</td>
<td>0.154</td>
</tr>
<tr>
<td>Central Asia</td>
<td>0.079</td>
<td>0.073</td>
<td>1.081</td>
<td>0.283</td>
</tr>
<tr>
<td>Caucasus</td>
<td>0.105</td>
<td>0.078</td>
<td>1.353</td>
<td>0.180</td>
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<tr>
<td>West</td>
<td>0.160</td>
<td>0.075</td>
<td>2.139</td>
<td>0.035</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.392</td>
<td>F-statistic</td>
<td>4.216</td>
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</tbody>
</table>
Figures

Fig. 1. The communist party membership in the USSR, 1922-1990. Sources: Rigby (1968), Ezhegodnik BSE (1971-1980), Gill (1994).

Fig. 2. Candidates and full party membership change, 1922-1990. Sources: See Fig.1. Calculations by the author.
Fig. 3. Alternative life-time income profiles of a worker.

Fig. 4. Alternative life-time income profiles of a boss.
Fig. 5. The supply of activists’ services and the demand for activists.
Fig. 6. The effects of economic performance on the parameters of promotion contract.

Fig. 7. Breach of contract by the bosses.
Fig. 8. Political-economic dynamics in the USSR, 1928-1990 (indices; 1928=1).
Black bars mark the periods of high turnover within the bureaucracy.
Sources: Candidates: see Fig.1; labor, investment - Easterly and Fisher (1995); expected rent - calculated by the present author from various sources.