

Coordination in Political Machinery Under Dictatorship: Signals, Shirking, and Repression

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Abstract

This paper sheds light on behavior of dictator and his officials in the soviet type totalitarian dictatorships. It is well-known fact that the plan in the soviet economy actually was a result of intrigues and secret negotiations between interested parties. Usually, direct executors were interested in cutting down plans, but in some cases they aimed to increase them. Particularly it concerns the fact of mass repression under dictatorships and overexpenditure of an administrative resource at elections in non-democratic and quasi-democratic countries. We present the simple model of interaction between principal (dictator) and his agents, which explain these paradoxical facts.

Key words: Dictatorship, Stalinism, Repression, Plan, Principal-Agent

JEL: P00, P26, N44, D73

1. Introduction: Problem Statement and Soviet Politic Experience.

Analyzing the specific situations occurred in the USSR during all existence of the state, especially under Stalin's dictatorship we find that examination of alternative strategy of bureau behavior is necessary. As a matter the plan was reported to be the basic indicator and signal of country development in conditions of command-administrative economic system. In Soviet Union there was a certain regulatory authority – Genplan (general plan) that supervised drawing up of the given document and its execution. Plans included not only economical parameters but also many other things, for example, the number of people who should be repressed. Officially similar plans were a subject to unconditional execution. Nevertheless, despite of a high degree of importance and obligatory fulfillment, actually the plan was not generally carried out.

In the industry and in the agricultural sector the first five-year period plans (pyatiletki) were obviously overstated in 1930th years. Therefore on places and in the branch ministries many bureaucrats struggled normative parameters' decreasing. Finally most of the first economic plans parameters have been reduced for some percent.¹ Inferior administrative structures also gave signals about the plan being unjustified and overstated, that also stimulated the further reduction of the plan. There were constant conflicts concerning the plan between officials from the Genplan, branch heads (commissars) and members of the Politbureau, who should report on performance of the plan to Stalin. Nevertheless, results of struggle for decrease in parameters were quite evident; finally after end of the first five-year periods the approved and cut plan has been fulfilled and moreover exceeded on some characteristics.

At the same time by some kinds of production, for example, agricultural products sometimes even high plans were accepted by officials and, without any struggle for decreasing planned parameters. And finally plan was carried out (in a reality or on a paper). For example,

¹ Data from Senokosov, 1989.

performance of the plan on grain crop in lean years in the beginning of 1930th years led to famine in many rural areas.² The plan on collectivization was even overfulfilled in terms.³

On some characteristics plans even were exceeded, and the bureau often signaled upward about the necessity of normative measures increasing (and achieved new parameters). In this context the plan for mass repressions is of special interest.

So in 1937 under absolutely confidential order 00447 "Operation on repression against former kulaki, criminals and other anti-soviet elements" from 30.07.37 contingents which were expected to be the victims of repressions had been precisely certain, thus two categories were allocated. The first category should be executed, and the second category should be arrested and imprisoned. As a result, according to the initial plan under the first category got 68800 (on other data 75950 person),⁴ and under the second category got about 190000 persons.

In the order regional distribution of repressed persons took place, but it correlated poorly with a regional population.⁵

At the same time in the order some certain liberties were provided. And, reduction of figures, but not increase was supposed. The increase of the plan's characteristics should be coordinated by regional and regional officials personally with the people's commissar of internal affairs Yezhov (that is the main official). Despite of large liberties an inferior official could not abuse the position, having broken the plan fulfillment without the high coordination. Almost at once a correction of the plan to the growth took place first from the Politbureau (higher authority). The quantity of victims belonged to the first category increased to 150500 people,⁶ and to the second category to 33250 people. There was an essential redistribution of a victims share to the first category. Then the People's Commissariat of Internal Affairs, in essence officials under their own initiative (that could poorly be coordinated with the assumption of

² Kondrashin, 1991.

³ Plan indicators were increased from 4 % of peasants' households in consolidated kolkhozes in 1933 to 16-18%. (Wikipedia)

⁴ data from Yakovlev, 2002.

⁵ Data from Official Census 1939. www.demoscope.ru

⁶ Data from Gregory, Schröder, and Sonin, 2006.

efforts minimization as one of the basic purposes of a bureau⁷) have lifted own plan to 129655 on the first category and 170960 on the second.

In other words, a significant excess of the repressions plan took place while on the other hand in updating of the industrial goods plan during the first five-year periods a significant decrease was usually observed. Analyzing of the plan fulfillment on places we can go to even more interesting results. By estimated figures finally 356105 people belonged to the first category and 397210 people belonged to the second category.

Finally officials have exceeded (and more, than on usual 1-2%) the plan on the first category, having shot 386798 person. On the second category there was some underfulfilment of the plan: only 380599 people were imprisoned. The general number of victims of reprisals has exceeded planned targets: 767397 against 753315.⁸ Thus, the general plan becomes covered due to increase in a share shot and reduction of a share sent in GULAG.

It is interesting to analyze also characteristic actions of officials at carrying out of other mass repressions waves: dekulakization (in the beginning 1930) and at repressions of certain nations (let us consider the beginning of the period in 1938).

Under the decree about dekulakization from 30.01.1930 persons subjected to repression were shared on two categories: kulaks (active enemies) and smaller enemies, and also kulaks' families. Kulaks must be either executed or sent to special camp. There was a certain plan: 60000 active enemies belonging to 1 category. Thus the plan did not specify in an obvious kind, how many enemies should be shot, and how many it is necessary to send in camp. Finally the plan have exceeded, having punished 65000 kulaks (18000 it has been shot). With families of kulaks and less dangerous enemies it was more complex. They were a subject to deportation on the certain territories, with the certain conditions of residing and under certain conditions to deportation. The majority of the given conditions registered in the decree.

⁷ See: Wyckoff,1990.

⁸ Data from Gregory, Schröder, and Sonin, 2006.

Default of the plan on the second category of persons was essential. Instead of scheduled 154000 it was possible to find and punish only 99515 enemies. Also long-term dekulakization problems assumed to repress totally 726000-1200000 people, basically due to the third category (persons who were made moving, but basically within the limits of area, without deportation). The plan has been underfulfilled even on this category. The final number of repression victims achieved only 500000-794275. Thus, it turns out, that the plan have exceeded only on detection of dangerous enemies.

Also, in a context of the present work purposes, it is interesting to consider repressions of certain nations (1938). In this case there were no special plans from superior officials. However the national attribute is difficult for hiding: probably, the dictator could supervise behavior of officials, using data of Censuses about national structure. As there was no plan, it was impossible to define initially, how many person should get under the first category (execution), and how many under the second. In essence all problems were solved by officials (agents), both on places, and in an administration of People's Commissariat of Internal Affairs. As a result, 247175 person it has been shot and 96556 it has been deported.⁹ Thus national cleanings were conducted precisely and in time: representatives of concrete nationalities in the certain places are subjected to repression practically all, thus other nationalities practically did not suffer. Thus, accuracy in execution of the given plan attracts attention of a researcher. By January, 1st, 1939 in GULAG there were 443262 prisoners arrested for counterrevolutionary crimes (less than 70000 of them were spies, the terrorists, the open opponents of the Soviet authority – they were not mass repression victims).¹⁰ Nevertheless, about 380000 victims of repressions in prisons not such greater figure approximately equal to the number of executed.

Even more interesting fact, in the contest of present work, is the repressions directed against officials. So, for example, for failure and underfulfilment of the first five-years period plans a few heads were punished, in most cases simply there was a deprivation of

⁹ All data from Gregory, Schröder, and Sonin, 2006.

¹⁰ Data from Yakovlev, 2002.

encouragements (the service blessings, an additional contentment, premiums). At the same time, despite of accurate performance, and sometimes overfulfilment of repression plan, punishments (even capital punishment) among officials-employees of People's Commissariat of Internal Affairs were applied often. Numerous cleanings led to change in administration of the organization in the end of 1930th years twice (the Berry has been replaced by Yezhov, Yezhov by Beria). Thus the former head has been shot.

Analyzing this situation, it is possible to draw a conclusion, that the plan in a reality was not so important document which demanded implicit performance. Many researchers considered command economy and analyzed the decisions, accepted in its frameworks are agree with this statement. As a matter of fact planned targets in many cases were accepted only for rough definition of the resources quantity necessary for achievement different results. Thus, as often party elite (Politbureau) and persons to it confidant did not understand completely all areas of a life of the country (that basically is impossible). There was updating in planned parameters from inferior branch officials. In other words, in internal markets of bureaucracy there were tenders about resource grants and decreasing of the key characteristics. In many cases plan scheduling, presence of different indicators in it depended on bargaining force and informal internal communications of numerous bureaus' heads, from ministerial officials to directors of plants and factories. So the plan was a signal for experts about resources distribution and an establishment of output standards.

At the same time the plan could not be a right indicator of the country development, and also could not give to the principal the real information neither on activity of its agents, nor on their conscientiousness. Hence, planned targets could not be used by a dictator as signals about behavior of bureaucracy.

We suppose that for supervision of official's conscientiousness he could use real branch release, defining deviation on different bureau parameters from each other. Thus, punishment which should act as the basic incentive to activity, in reality poorly depended on the plan

fulfillment, and was defined by comparing results of the given bureau's activity with results of other bureaus' (engaged similar production) activity.

It is important to notice, that in that case it is difficult to consider specific features of bureau functioning which can not depend on officials' efforts. As a result, formed repression system could punish both shirking bureaucrats (that raises the future output of the goods because negative incentives find addressees),¹¹ and innocent non-shirking bureaucrats who made all necessary efforts (that, on the contrary, undermines stimulus to increase output). The similar situation, only with smaller incentive effect could be observed with positive incentives.

In other words, optimization problem solved by the dictator consists of definition for each branch a share of the officials who have shown worst, from the dictator's point of view, results and, as the consequence, should be punished. Probabilities of punishment both shirking and non-shirking bureaucrats depend on size of the given share. With growth of a punished share both probabilities increase. We shall note, that as the dictator is interested in construction optimum, from the point of expenses-results, incentive system he will try to minimize probability of repressions against diligent, non-shirking officials and, on the contrary, to maximize the given probability for shirking officials.

Hence, the general share of punished will grow in that case when the dictator can receive more precise signals about activity of a bureau. For example, when their production is easily estimated, conditions are almost the same or specific features can be estimated. In that case, the dictator will choose rather a big share of the officials who should be punished for opportunistic behavior (in this case it will be dictator's optimum).

In case of indistinct, hardly identified signals it is more difficult for dictator to distinguish innocent from guilty then in order to prevent creation of distorting incentives he, likely, will make a decision to not apply repressions against the big group of defaulters.

¹¹ Thesis about type-I enforcement mistakes (punishment of innocent) weakening deterrence confirmed both intuitively and in some theoretical works dedicated to economical analyses of criminal law. For example: Ehrlich, 1982; Png, 1986; Kaplow and Shavell, 1994.

According to the dictator's behavior the official understands, that can find himself in the group of risk. Depending on probability of punishment for appearing in the certain number of the worst agents defined by the dictator (by results of), the official can choose various strategy of behavior, as is described in formal model (it will be presented below). Thus, officials can be interested in either underfulfilment, or overfulfilment the plan, and sanctions can be imposed both on non-shirking, and on shirking. The last phenomenon can stimulate agents not only to investment into reduction, but also into increase of the plan.

It is necessary to notice, that presented below model explains not only behavior of repressive authorities' officials under dictatorship. It can be used to analysis behavior of dictators and bureaucracy, in particular. The situation common with mass and active overfulfilment of the repression plan on places and its increase, occurred in 1937, is observed at the analysis of election results in Republic Kazakhstan or in Tatarstan (when Head of regions in Russian Federations was voted the population). In this case we find the overexpenditure of an administrative resource, that is officials on places exceed the plan on elections presence and to a poll for the certain candidate, even including juggling of voices. As a result a pro-presidential party "Nur Otan" In Kazakhstan got 88,05 %, and the nearest party only 4,62%.¹² In Tatarstan Shaymiev got in 2001 about 80%.¹³ The paradox is that the candidate could win even in case of underfulfilment of the plan without using an administrative resource (because he is supported more than at half of population). Thus, over effort of bureaucracy only worsen its position and strengthen opposition cause of scandals and additional conversations on falsification of elections. At the same time the behavior of the local officials minimizing the risk can be understood, because for unsatisfactory results various punishments will follow. So, for example, as a result of elections in the Russian parliament (Duma) in the Yaroslavl and Smolensk regions areas a party of sovereignty "United Russia" received one of the lowest percent in Russia(33,13 and 29,56

¹² Central Election Comities of Kazakhstan, <http://election.kz/>

¹³ Central Election Comities of Russia, www.cikrf.ru

accordingly¹⁴), as a result governors of the regions areas have been translated for other work¹⁵ (may be for lack of an administrative resource).

2. Literature review.

For today there is enough literature devoted to dictatorship and peculiarities of dictator economy, particularly to command plan economy¹⁶. At the same time the problem of relationship between dictator and bureaucracy behavior was not examined thoroughly by researches. Nevertheless there are some papers which shed light on this problem.

First of all we should mention classical work “The Socialist System: The Political Economy of Communism”¹⁷ by J. Kornai. In this book there is a lot of information about peculiarities of bureaucracy work in command economy. In Kornai’s work one can find conditions of bureaucracy work and some characteristic features of coordination within this system, incentives for officials, forcing mechanism; there are different approaches to behavior of the bureaucracy managing different goods production. Besides, a lot of material is devoted to plan and relationships about it. But this work focuses on relationships between party (dictatorship of the party) and bureaucracy after Stalin’s (personal dictatorship) regime period. Thus Kornai examines established system of connections, institutes and informal relationships, where all mechanisms of risk avoidance are clear results of negotiation force. In our article we try to analyze principal-agent relationships in totalitarian personal dictatorship (for example Stalin’s dictatorship), if the power of dictator over his agents is almost unlimited.

Well-known Wintraub’s works usually devoted to relationships between dictator’s targets and policy conducted by him. According to them he made almost universally recognized

¹⁴ Central Election Comities of Russia, www.cikrf.ru

¹⁵ IA Regnum, <http://regnum.ru/>

¹⁶ Especially, this subject became very popular at the latest years. See, for instance: Escribà-Folch, 2007 (about dictator’s incentives to rent-extraction as a function of his probability of punishment after loosing power); Gandhi and Przeworski, 2006 (authors explain, why many dictatorships create democratic or quasi-democratic institutions); Congleton, 2001 (this paper provides an explanation of presence parliamentary and executive branches of power in dictatorships and kingdoms, and also provides an evolutionary model of democracy); Wilke, 2002 (about public welfare consequences of belligerent stationary banditry in McGuire and Olson, 1996 model of autocracy). See also: Acemoglu and Robinson, 2000; 2005; Jeong, 2000; Kurrild-Klitgaard, 2000; Herreros, 2006

¹⁷ Kornai, 1992.

classification of dictatorships¹⁸. Wintraub also examines competition between bureaus as a source of dictatorship's comparative efficiency. His approach is connected with our results but in our model officials' competition not always lead to the effective (from dictator's point of view) result: sometimes goods can be overproduced.

Other classical research papers devoted to this problem are the works of Gregory. In his works Gregory examined different characteristic features of Soviet command economy and also in the period of 1930-years. For example, some articles¹⁹ describe redistribution of goods and resources among the highest level bureaus and show the role of informal relationships and internal contracts (vertical or horizontal) in different problems solution. The author pays attention to coordination, internal markets of bureaucracy and negotiation mechanism (negotiation force) between different authorities.²⁰ I. e. in the articles unimportance of plan is proved, and officials can manipulate it for resource redistribution. At the same time we can find in these works peculiarities of information disclosure for dictators to realize individual or collective risk-avoidance (collective actions of bureau or within bureau), that is not connected to plan.

Mechanisms of public administration are described in detail in Gregory's book *The Political Economy of Stalinism*. In this book the thesis about plan (even under Stalin's reign) being a result of intrigues and secret negotiations, but not being a scientific fundament of Soviet economy development, is proved.

In the article by Gregory, Schröder, and Sonin²¹ mechanisms of mass repressions are observed and reasons for them (from the point of rational dictator view) are found out. The research is not devoted to "principal-agent" problem and behavior of bureaucracy, but it describes dictator's behavior. Besides this work contains plenty of statistical data used for analysis in our article.

¹⁸ Wintrobe, 1990; 1998.

¹⁹ Lazarev and Gregory, 2003.

²⁰ Belova and Gregory, 2001.

²¹ Gregory, Schröder, and Sonin, 2006.

The article by Sonin and Egorov²² is devoted to agency relationship in totalitarian economy. There is a model in it, which explains why dictator prefers loyal agents to competent.

Besides, models describing dictator's behavior and comparison of the same actions under dictatorship and democracy are situated in the article by Kalyagin and Sidorenko²³. Although the paper is devoted to criminal law enforcement under dictatorship there are some common mechanisms of enforcement and dictator's strategies, when he manages his subordinate officials. In other words, in case of punishment great quantity of both innocent and guilty officials will get under repressions. The same approach to the relationship between dictator and his chain of command assumed in this work.

3. The Model.

3.1. Dictator's choice.

We consider relations between the dictator and subordinate officials, engaged in manufacturing of different homogeneous goods or services. In other words, the bureaus belong to certain branch. The dictator allocates resources to the agents for manufacturing of a certain good according to exogenous established plan. So, the dictator knows that the plan is not the scientifically-proved document, as it was officially claimed in the USSR, it represents only result of the negotiations between various levels of administrative hierarchy, therefore serves only for detection of the resources quantity which the dictator allocates among the bureaus.

At the same time the plan is not a signal for the dictator. So he will use other criterion as an indicator of the official's conscientiousness, for example, the real output of the bureau²⁴, multiplied by a correction factor $a_i > 0$, reflecting differences in conditions of manufacture between homogeneous bureaus. In other words, a_i is considered to be an indicator which shows a degree of signal's sending to the dictator purity.

²² Egorov and Sonin, 2006.

²³ Kalyagin and Sidorenko, 2007.

²⁴ We assume that the dictator possesses the full information on results actually achieved by a bureau. In other words, in the given model we suppose that a bureau have no opportunity to be engaged in distortions which actually were popular in socialist economy.

Thus, if, $a_i w_i \geq a_m w_m$ agent i will be perceived by the dictator as non-shirking, and consequently, he cannot be a subject of punishment. The dictator's task consists in definition of optimum quantity of m bureaus, which should be punished from n block. As a result, for each branch the dictator will choose an optimum share of repression victims $\frac{m^*}{n}$. The dictator understands that such a punishment can overtake either shirking (with probability q), or innocent bureaucrats with objectively bad working conditions (with probability r). And, that presence of an internal optimum $m^* < n$ in the model is provided by several conditions:

$$\frac{\partial q}{\partial m} > 0, \quad \frac{\partial r}{\partial m} > 0, \quad \frac{\partial^2 q}{\partial m^2} < 0, \quad \frac{\partial^2 r}{\partial m^2} > 0.$$

In other words, increase of a share of punished innocent bureaucrats must weaken incentives for high-productive work, thus, output will decrease, and hence, welfare of the dictator will fall too. The dictator considers the given fact; therefore he applies repressions with care.

From the dictator's point of view incentive compatibility constraints for the official looks as certain equation:

$$(w_i - x_i)c_i + qs > w_i c_i + rs \quad (1)$$

Where w_i is the output of the non-shirking bureaucrat, x_i is an assessment of shirking, expressed in physical units of produced good, c_i are the costs of produced unit for a bureau i (they are assumed by constants), s shows sanctions (penalties) established by the dictator for the official (or officials) of a bureau i , if $a_i w_i < a_m w_m$. If we accept the precondition that punishment for the dictator costs 0, the choice of maximal heavy punishment will be optimum for him. As it will be shown below, such choice of the dictator is represented by enough realistic precondition. The inequality (1) can be presented in the form of: $(q - r)s > x_i c_i$.

Let us go back to the signals, to a indicators, which are responsible for them. As a matter of fact their distribution depends on a lot of parameters exact assessment of which is connected

for the dictator with restrictive high costs: fields of activity of a bureau, branch, complexity of works, certain function of costs for each bureau, etc. And the more is the scattering of a parameters, the more (if other things are equal) is probability of dictator's type-I enforcement mistake, so that he will refuse mass repressions with greater probability, being afraid to sink dramatically incentives for the further output of the good.

$$m^* = m^*(\delta[a_i]) \quad (2)$$

Where $\frac{\partial m^*}{\partial \delta} < 0$. δ – is a parameter reflecting dispersion of a and depending on standard deviation and the number of bureaus in certain branch. $\delta(a_i) = \frac{\sigma(a_i)}{n}$. Thus, the increase of number of examining enterprises or bureaus will reduce the uncertainty and dispersion of a , increasing the number of punished officials. According to these conditions the function of dictator's welfare takes on form²⁵:

$$W_d = b \sum v_i \left(\frac{m}{n} [\delta(a_i)] \right) - \sum p_i c_0 - kR \quad (3)$$

Where b is a value for the dictator of good (it is supposed to be a constant), v_i the output produced by the bureaucrat i , thus it is important to notice, that the given parameter determine output of the goods observable by the dictator because he cannot completely estimate efforts of the official. Thus, v consists of output which bureau really can produce adjusted for possible shirking x ($x=0$ in case of non-shirking). So by more detailed analysis function takes on form

$$v_i = w_i - x_i.$$

Further, p_i is the plan for a bureau i ; c_0 is a cost price of one produced unit, it is supposed identical to all a bureau; R - the premium for fulfillment or overfullfilment of the plan²⁶; k - number of the bureaus fulfilling or exceeding the plan, for which $w_i \geq p_i$.

²⁵ We assume that the dictator pays his agents market wages. Wage does not influence on decisions making by dictator, so it is not reflected in his welfare function.

²⁶ Premium is an exogenous variable. If we suppose it endogenous the substantial conclusion of the model will remain the same, but mathematical manipulation will become more difficult.

Thus, the dictator solves simple optimization task, and a unique variable on which its function of welfare is maximized will be the number of officials (or bureaus) should be punished:

$$m^* = \arg \max W_d \quad (4)$$

Model which is presented here already definitely explains the historical phenomena. So, for example, at melt of steel there is a small amount of responsible officials, thus conditions are very different at the different enterprises, the dispersion of parameters is great, signals to the dictator can be sent strongly distorted, hence, optimum number of punished, from the point of view of the dictator, is insignificant, and the plan was regularly reconsidered aside downturn. On the other hand, the plan on repressions of the Soviet authority enemies has been issued to all branches of People's Commissariat of Internal Affairs in administrative territorial districts of the USSR, conditions everywhere are approximately identical, to checking up fulfillment (to count up enemies) was an easy task. So the signals were exact, the dispersion was small, hence, fulfillment of the plan and increase in the number of punished could be expected. We shall consider now reaction of agents to the incentives put before them by the dictator.

3.2. Official's choice.

To begin with we shall accept following preconditions:

1. An official receives the certain number of resources from the dictator on fulfillment of the plan (it is coordinated by negotiations), it is possible to receive premium R for the plan fulfillment.

2. If an official does not shirk, he spends all allocated resources for production of goods

$p_i c_0 = w_i c_i$. So despite of chosen strategy we get the equation $v_i = \frac{p_i c_0}{c_i} - x_i$

3. An official does not distinguish fair and unfair punishment, taking this situation for granted (all the same in behavior of the dictator there are a lot of accidents).

4. Using the certain resources it is possible to agree about increase or downturn of the plan.

In a general view the welfare function of the official in the certain branch will look as follows:

$$\theta_i = p_i c_0 - (w_i - x_i) c_i - u \left(v_i \frac{m^*}{n} \right)^s - c_1 (p_i - p_1) - c_2 (p_2 - p_i) \quad (5)$$

Where $p_i c_0$ are the resources allocated by a bureau to fulfill the plan (a cost price of one produced unit, it is supposed identical to all a bureau); $(w_i - x_i) c_i$ - expenditures for performance of the plan in case of potential shirking. In case of shirking when $x_i \geq 0$ formula takes on form $v_i c_i$ ($v_i = w_i - x_i$); where $u \left(v_i \frac{m^*}{n} \right)^s$; is possible punishment (validity is not important) which comes with probability u (thus probability depends on output and a share punished in the given branch, see above, model of the dictator's choice); $(p_i - p_1) c_1$ - expenditures for downturn of the plan from a level p_i down to a level p_1 ; $(p_2 - p_i) c_2$ - expenditures for increase of the plan from a level p_i up to a level p_2 ; c_1 and c_2 are specific costs of a downturn and increase of the plan (they are supposed to be constant). Thus, the official has a lot of possible alternative behavior strategies.

There are three variants of a ratio between size of a planned target on the one hand and a choice the official of fair or opportunistic behavior strategy on the other hand: 1) "Underestimated" plan. The official fulfils it without dependence from the chosen behavior strategy; 2) "Overestimated" plan. The official cannot fulfill it without shirking; 3) "Exact" plan. It is fulfilled by the official if he chooses a fair strategy and it is not fulfilled in case of opportunistic behavior choice.

We shall consider each of these three variants more in detail.

"Underestimated" plan.

If the plan is not great, and an official (or bureau) can fulfill it even shirking, he has no reasons (within the restrictions of the given model) and no incentives to struggle for the plan

reduction, because he will receive the premium in any case. On the other hand, struggle for increase of the plan can be the official's optimum choice as he can increase in this case his total output reducing the probability of punishment for himself.

Accordingly, four variants of official's behavior are presented in table 1.

Table 1

Strategy	Behavior	Result
Non-shirking	Plan increasing	$\theta_{i.u}^{n.s.i} = R - u\left(\frac{p_2 c_0}{c_i} \frac{m^*}{n}\right) s - c_2 (p_2 - p_i)$ (6)
	Keeping status quo	$\theta_{i.u}^{n.s.s.q} = R - u\left(\frac{p_i c_0}{c_i} \frac{m^*}{n}\right) s$ (7)
Shirking	Plan increasing	$\theta_{i.u}^{s.i} = x_i c_i + R - u\left(\left[\frac{p_2 c_0}{c_i} - x_i\right] \frac{m^*}{n}\right) s - c_2 (p_2 - p_i)$ (8)
	Keeping status quo	$\theta_{i.u}^{s.s.q} = x_i c_i + R - u\left(\left[\frac{p_i c_0}{c_i} - x_i\right] \frac{m^*}{n}\right) s$ (9)

According to equations (6) – (9) official can choose one of the four strategies (the choice is determined by certain parameters).

“Overestimated” plan.

Unlike the previous case, if the plan for bureau i is overestimated, it officials of can find favorable to invest not only in reduction (this is clear intuitively), but also in increase of the plan as these investments can lead to reduction of probability and, in some cases, expected heaviness of the punishment for official. Thus, six variants of official's behavior are possible.

Table 2.

Strategy	Behavior	Result
Non-shirking	Plan increasing	$\theta_{i.o}^{n.s.i} = -u\left(\frac{p_2 c_0}{c_i} \frac{m^*}{n}\right) s - c_2 (p_2 - p_i)$ (10)
	Keeping status quo	$\theta_{i.o}^{n.s.s.q} = -u\left(\frac{p_i c_0}{c_i} \frac{m^*}{n}\right) s$ (11)
	Plan decreasing	$\theta_{i.o}^{n.s.d} = R - u\left(\frac{p_1 c_0}{c_i} \frac{m^*}{n}\right) s - c_1 (p_i - p_1)$ (12)
Shirking	Plan increasing	$\theta_{i.o}^{s.i} = x_i c_i - u\left(\left[\frac{p_2 c_0}{c_i} - x_i\right] \frac{m^*}{n}\right) s - c_2 (p_2 - p_i)$ (13)

	Keeping status quo	$\theta_{i.o}^{s.s.q} = x_i c_i - u \left(\left[\frac{p_i c_0}{c_i} - x_i \right] \frac{m^*}{n} \right) s$ (14)
	Plan decreasing	$\theta_{i.o}^{s.d} = R + x_i c_i - u \left(\left[\frac{p_1 c_0}{c_i} - x_i \right] \frac{m^*}{n} \right) s - c_1 (p_i - p_1)$ (15)

Equations (10) and (11) within the restrictions of the given model do not satisfy participation constraints, so they cannot be considered as realistic strategies. All the other strategies may be dominating for officials in some cases (it depends on certain level of the parameters).

“Exact” plan.

In case when the plan fulfillment encourages fair behavior of an official with premium R, there is sense to struggle for the plan reduction (if the official does not shirk). Actually, the results received by the official in this situation coincide with results which it receives by “underestimated” plans. If the official will choose shirking strategy, his results will be identical to the results received in case of shirking strategy by “overestimated” plan.

Table 3.

Strategy	Behavior	Result
Non-shirking	Plan increasing	$\theta_{i.p}^{n.s.i} = R - u \left(\frac{p_2 c_0}{c_i} \frac{m^*}{n} \right) s - c_2 (p_2 - p_i)$ (16)
	Keeping status quo	$\theta_{i.p}^{n.s.s.q} = R - u \left(\frac{p_i c_0}{c_i} \frac{m^*}{n} \right) s$ (17)
Shirking	Plan increasing	$\theta_{i.p}^{s.i} = x_i c_i - u \left(\left[\frac{p_2 c_0}{c_i} - x_i \right] \frac{m^*}{n} \right) s - c_2 (p_2 - p_i)$ (18)
	Keeping status quo	$\theta_{i.p}^{s.s.q} = x_i c_i - u \left(\left[\frac{p_i c_0}{c_i} - x_i \right] \frac{m^*}{n} \right) s$ (19)
	Plan decreasing	$\theta_{i.p}^{s.d} = R + x_i c_i - u \left(\left[\frac{p_1 c_0}{c_i} - x_i \right] \frac{m^*}{n} \right) s - c_1 (p_i - p_1)$ (20)

Thus, we can see that according to external conditions, strategies of bureaucracy behavior under the dictatorship can be various. Differences in conditions explain various rate of existing

plans delivery; actions on their change and imposing of sanctions for default. Finally, agents depending on the listed conditions can have all the bases to achieve not only reduction of planned targets established by the dictator, but also their increase.

4. Further research.

Analyzing the given model it is necessary to pay attention to a problem of costs. Probably, if there were some alternatives of plan fulfillment the cheapest one way chosen then an official report about the fulfillment or even overfulfillment took place. Thus, risk avoidance, and reception of premiums proceeded successfully. Similar reflections appear as a result of certain historical examples (about mass repressions) consideration. So, for example, in 1937 during numerous increases of scheduled norms, finally officials on places exceeded the plan, having shot 386798 people. On the second category there was some underfulfilment of the plan 380599 person. The total number of repression victims has exceeded planned targets and has finally achieved figure 767397 (753315 in plan)²⁷.

Probably an official, making a decision usually is guided by costs. For example, execution costs are obviously less, than costs of the prisons or camps, besides additional costs on detention centers and transportation under guard also take place. Thus, the general plan covered due to increase of a share persons shot and reduction of a share persons sent in camp. So, plan fulfillment with less costs (and even overfulfillment, reducing expected costs of punishment for officials) occurred due to extension of cheap production output.

It is interesting to analyze repressions of nations (1937-1938). There was not a certain plan. However the national attribute is difficult for hiding and the dictator supervisors were able to control officials' behavior, using data of Censuses about national structure. As there was no plan, it was impossible to define initially, how many people would get under 1 category (execution), and how many under 2 (deportation, obviously, not less expensive, than during the

²⁷ Data from Gregory, Schröder, and Sonin, 2006; and Yakovlev, 2002.

dekulakization). In reality all decisions were made by officials, both on places, and in administration of People's Commissariat of Internal Affairs.

In some cases the plan sets limits from possible excesses towards cheaper ways of its fulfillment. In case of repressions of nations limits were not set. As result 247175 person it has been shot and 96556 it has been deported²⁸. Comparing the data with the previous results (dekulakization, mass repression) the cost saving is obvious. Thus national cleanings were arranged accurately: almost all representatives of certain nationalities in the certain places were repressed, though other nationalities practically did not suffer from repressions.

During the dekulakization in the beginning of 1930th years the plan was exceeded only on detection and execution of the most dangerous enemies, contrary the worst situation was with the long-term repression plan. According to the long-term dekulakization plan 726000-1200000 people should be repressed, basically due to the so-called third categories: persons who were made move to new places, but basically within the area (they must not cross borders of their region), without deportation. It is obvious, that because of the big size of the third categories costs of moving were great. The plan was underfulfilled. The final number subjected to repression has made 500000-794275.²⁹

Examining the received results we go to the conclusion that cost analysis is important and sometimes crucially required for modeling strategies of officials' behavior. Using cost examination we can explain from economic point of view some more phenomena. So our next step will be cost-beneficial research of bureaucracy behavior under dictatorship.

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