

# Coordination in Political Machinery under Dictatorship: Signals, Shirking, and Repression

by

*Grigory V. Kalyagin,*

*Department of Economics, Lomonosov Moscow State University<sup>a</sup>,*

*E-mail: [kalyagin@econ.msu.ru](mailto:kalyagin@econ.msu.ru)*

*Vladimir A. Kozlov,*

*Department of Demography, National Research University - Higher School of  
Economics<sup>b</sup>,*

*E-mail: [kozloww@gmail.ru](mailto:kozloww@gmail.ru)*

*<sup>a</sup>GSP-1, Leninskie Gory, Lomonosov MSU, The 3<sup>d</sup> New Educational Building,  
Economic faculty, 119991, Moscow, Russian Federation*

*<sup>b</sup> Pokrovskiy bul., 11, office 221D, 109028, Moscow, Russian Federation*

## **Abstract**

This paper is devoted to the explanation of selected bureaus' behavior patterns in the soviet type of totalitarian dictatorships with the command economic model. It is a proven fact that the plan figures in the soviet economy were fabricated as a consequence of intrigues and secret negotiations between different interested parties. Generally, bureaus, as rational agents that minimize risk and maximize slack, should have been interested in reducing the plan figures, nevertheless, they strived to increase them. As examples, mass repression under dictatorships and overexpenditure of an administrative leverage at elections in non-democratic and quasi-democratic countries can be observed. In the article we develop a simple model of coordination between principal (dictator) and his agents (bureaus), which explain the mentioned paradoxical situation.

Key words: Dictatorship, Stalinism, Repression, Plan, Coordination problem

JEL: P00, P26, N44, D73

# 1. Introduction and Problem Statement

## 1.1. Plan Implementation in Soviet command economy: case-study

Theoretically, a state directive plan implementation is a basic indicator of country development, a signal to the principal about agents' behavior, and a main coordination mechanism for the command economic system. Plan figures were formally regulated from an administrative centre - for example, in Soviet Union there was a certain regulatory authority, called the Genplan (general plan), that acted as a central supervisor and controller of this plan's creation and execution. However, Soviet plans included not only economic parameters but also other ones, for example, the number of state enemies who should be repressed<sup>1</sup>. According to the official position of the state, the plans were expected to be implemented unconditionally. Nevertheless, despite all of the ideological claims and, in some cases, official reports, many plans were not fulfilled, and others were successfully overfulfilled. Analysing the USSR during the entire period of the command economic model's existence (especially under Stalin's dictatorship), we find that bureaus responsible for the plan implementery, had many of alternative behavior strategies. These strategies will be analyzed as the main research topic of this article.

For most of the branches in industrial and extraction sectors the first five-year period (1929-1933, the beginning of Soviet Industrialization) plans were obviously overestimated. Therefore bureaucrats on-site and in the central offices of branch ministries struggled to reduce the normative parameters, and finally most of the first economic plans numbers were cut down<sup>2</sup>. There were constant conflicts concerning the plan between officials from the central authority - Genplan, branch heads (commissars) and members of the Politbureau, who reported on implementation of the plan to Stalin. Nevertheless, results of struggle for the decrease in parameters were quite evident. After the end of the first five-year period the approved and

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<sup>1</sup> Naturally political parameters, like those mentioned in the text were not designed by economic authorities, but were contained in special orders and prescripts.

<sup>2</sup> Data from Senokosov, 1989.

severely cut plan was implemented; moreover, some figures even exceeded normative characteristics.

For some kinds of output, for example the agricultural sector plans even higher than in industrial sector were accepted by branch officials without any coordinated opposition. And, more importantly, most of the plans were implemented, even if they led to negative external effects. For example, the overestimated plan for grain production in nonseed years in the beginning of 1930s that supposed one of the main causes for the great famine in rural areas of the Soviet Union.<sup>3</sup>

Moreover in Soviet economic history there were cases when plans were successfully implemented and even overfulfilled, but bureaus signaled the necessity of continuously increasing the normative indicators (and these advanced parameters were achieved as well). In this context, implementation of the plan for mass repressions is a case of special interest.

The plan for repression that is within the scope of our research was contained in the confidential Order 00447 "Operation on repression against former kulaki, criminals and other anti-soviet elements" of People's Commissariat for Internal Affairs (NKVD) from 30.07.1937. Those who were expected to be the victims of repressions according to the mentioned above Order were formally indicated; the Order also defined two basic categories of the repressed. The first category should be executed immediately, and the second category should be arrested and imprisoned. As a result, according to the initial plan the first category included 65 950 (including special NKVD camps - 75 950) persons, and the second category included - 193 000.<sup>4</sup> In the Order regional distribution of repressed persons correlated poorly with a regional population ratio.<sup>5</sup>

The bureaus were granted certain liberties in interpreting the plan – as a matter of fact, the reduction of normative figures on-site was expected by central authorities. Despite liberties the plan implementation, an inferior official could not abuse the position or break the plan

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<sup>3</sup> Kondrashin, 1991.

<sup>4</sup> Source: Yakovlev, 2002, pp. 98-99 and Gregory, Schröder, and Sonin, 2006, p. 8.

<sup>5</sup> Data from Official Census 1939. <http://demoscope.ru/weekly/ssp/census.php?cy=2>

fulfillment without coordination with the regional officials or in some cases personally with the People's Commissar for internal affairs Yezhov.

Almost at once a correction of the normative figures took place. From the top of the official pyramid (Politbureau higher authority), the quantity of victims belonging to the first category grew to 150 500 people,<sup>6</sup> and to the second category decreased to 33 250 people, there was an essential redistribution of victims to the first category. Later, the People's Commissariat of Internal Affairs, in essence officials under their own initiative<sup>7</sup> corrected the plan figures to 129 655 victims belonging to the first category and 170 960 belonging to the second one. We can claim that a significant increase of normative figures in the repressions plan took place, while in contrast a decrease in the industrial sector plan was usually observed.

Analyzing the plan revisions on-site in the regions, we will find more interesting results: by estimated figures the final normative number of repressed persons was 356 105 people belonging to the first category and 397 210 people belonging to the second category. Ultimately, officials overfulfilled the plan on the first category, having shot 386 798 person, while for the second category there was some underfulfillment of the plan (380 599 people were imprisoned). The total number of victims exceeded planned targets: 767 397 against 753 315. Thus, the general plan was implemented with an increase victims executed and a reduction in victims imprisoned in GULAG system.

To observe the situation in greater detail, we examine the behavior of officials during other mass repressions waves: dekulakization<sup>8</sup> (in the beginning of the 1930s) and repressions of certain nations (here we consider those beginning in 1938).

Under the Decree about dekulakization from 30.01.1930 persons subjected to repression were distinguished into two main categories: kulaks (active enemies) and lesser enemies,

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<sup>6</sup> Source for all figures on the pages 4-5: Gregory, Schröder, and Sonin, 2006, p. 8.

<sup>7</sup> This initiative correlates poorly with the goal of efforts minimization (slack maximization) as one of the basic theoretic purposes of a bureau See: Wyckoff, 1990.

<sup>8</sup> A campaign against rich peasants and property owners (so-called kulaks) in rural areas of the Soviet Union.

including also kulaks' families<sup>9</sup>. Kulaks were to be executed or sent to special camps. There were certain plan figures: 60 000 active enemies belonging to the first category. Thus the plan did not specify the number of executed and imprisoned enemies. The plan figures were ultimately overfulfilled, as 65 000 kulaks were repressed and 18 000 of them were executed.

The situation with families of kulaks and less dangerous enemies was more ambiguous. According to the Decree, this category was to be deported to the certain territories: transportation methods and living conditions for the deported enemies were rigidly defined. Instead of the normatively indicated 154 000 persons, it was possible to find and repress only 99 515 enemies. The next steps of the dekulakization campaign focused on persons who were not deported to the special areas, but were forced to leave their area. Consequently, in the long-term period of dekulakization the plan figures for repressions were 726 000 – 1 200 000 people (the variation was due to the third category). The whole plan was underfulfilled because the final number of repression victims was 500 000 – 794 275. However the normative figures were achieved and even exceeded in the case of dangerous active enemies (the first category).

In a context of the present work, we take into account the repressions of certain nations (starting in 1938). In this case, there were no special plans from superior officials. Though there were no national quotas, the behavior of officials could easily be supervised using Census data. The potential victims were also distinguished into 2 categories: those who should be executed, and those who should be repressed in a certain way (generally deported). As there was no plan, it was impossible to define initially, how many person should be repressed under the first category, and how many under the second. In essence all problems were solved by officials (agents), both on-site, and in regional administrations of People's Commissariat of Internal Affairs. In total 247 175 persons were executed and 96 556 were deported.<sup>10</sup> Thus national purges were carried out precisely, accurately and in time: practically all representatives of indicated nationalities in the certain places were repressed, however other nationalities were exempted.

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<sup>9</sup> Later the third category of the least dangerous enemies was included in plan. The persons belonging to this category should be resettled within the region of their origin.

<sup>10</sup> All data from Gregory, Schröder, and Sonin, 2006.

By January, 1<sup>st</sup>, 1939 in Soviet camps (GULAG system) there were 443 262 prisoners arrested for counterrevolutionary crimes (less than 70 000 of them were actually spies, terrorists, or open opponents of the Soviet authority – they were not mass repression victims).<sup>11</sup> Nevertheless, about 380 000 victims of repressions in prisons is a figure approximately equal to the number of executed.

## **1.2. Role of Plan in the Soviet Politic System**

Observing the cases above, it is possible to arrive at the conclusion, that the plan in reality was an unimportant document which nevertheless demanded performance. As a matter of fact, planned figures in many cases were accepted only for rough distribution of the resources necessary for achieving results. As the government (a party elite - Politbureau) and most of ministry major officials could not completely understand all areas of life in the country, the corrections and updatings in planned parameters from inferior branch officials were widespread. In other words, in internal markets of bureaucracy, officials negotiated about resource grants and decreasing the key plan characteristics. Therefore, plan characteristics depended on bargaining power and informal internal communications of numerous bureaus' heads, from ministerial officials to executive directors of small bureaus, plants and factories. The plan functioned as a signal coming from the top to the bottom of the hierarchical pyramid about resources allocation and forthcoming output standards. At the same time, for high-level officials and dictator, plan implementation was not an accurate indicator of country development or agents' performance, due to numerous on-site corrections.

In order to supervise an official's conscientiousness, the dictator could use real figures about the output of certain goods or services (even if the state services are repressions) in a certain sector. Next, the dictator could define deviation based on different branch bureaus parameters in that sector. Thus, according to our hypothesis, punishment which should act as the basic incentive to activity and prevention of opportunistic behavior, in reality poorly depended

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<sup>11</sup> Data from Yakovlev, 2002.

on the plan fulfillment, and was defined by comparing results of the given bureau activity with results of other bureaus engaged in similar production activity.

It is important to note, that it is difficult to consider specific features of bureau functioning which may not depend on officials' efforts. As a result, the repression system could punish both shirking bureaucrats (an active measure that raises the future output because negative incentives find addressees), and innocent non-shirking bureaucrats who made all necessary efforts (which, on the contrary, undermines stimulus to increase output)<sup>12</sup> in harsh nature conditions. A similar situation with a smaller incentive effect could be observed with positive incentives (for example, bonuses for the bureaus with significantly higher parameters of output in comparison with others).

In other words, for each branch, the optimization problem solved by the dictator consists of subjective definition of a share of officials who have shown the worst results and, consequently, should be punished. Probabilities of punishment both shirking and non-shirking bureaucrats depend on the size of the chosen share, increasing with the growth of a punished share. We shall note, that as the dictator is interested in construction optimization, from the point of the expenses-results incentive system, he will try to minimize the probability of repression against diligent, non-shirking officials and, on the contrary, to maximize the given probability for shirking officials. Therefore, the general share of punished officials will grow in case of more precise and clear signals about activity of a bureau. For example, when the production of a certain branch can be easily estimated and conditions of work are almost the same, or existing specific features can be estimated without any obstacles, the dictator will choose more officials who should be punished for opportunistic behavior (in this case it will be dictator's optimum, because the situation is primarily transparent, and he would have no reasonable doubts about their guilt). In the case of indistinct, hardly identified signals, it is more difficult for dictator to

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<sup>12</sup> 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.

distinguish the innocent from the guilty. In order to prevent creation of distorting incentives, he, likely, would make a decision to not apply repressions against the big group of defaulters.

Now we shed light on the officials' strategies. According to the dictator's behavior and characteristics of the branch and bureau, the official believes a probability to be involved into the group of risk. In accordance of self-perception of probability to be punished for appearing in the list of the worst agents, the official can choose various strategy of behavior, as it is described in a formal model (it will be presented below). Thus, officials can be interested in either underfulfillment or overfulfillment of the plan, and sanctions can be imposed both on non-shirking and on shirking. The last phenomenon can stimulate agents not only to invest in reduction, but also in increase of the plan.

### **1.3. Administrative leverage overexpenditure**

It is important to note that the logic presented in previous arguments and the model below explains officials' behavior under dictatorship and, more broadly, analyzes relationships between dictators and bureaucracy. A situation similar to the overfulfilment of the repression plan was observed in recent elections in Kazakhstan and in Russian region Tatarstan (when Head of regions in Russian Federations was voted by population). In these cases we find the overexpenditure of administrative leverage in which officials use election fraud to inflate the number of votes for a certain candidate. As a result, a propresidential party "Nur Otan" in Kazakhstan (2007) received 88,41% of the vote, and the nearest party only received 4,54%.<sup>13</sup> In Tatarstan, previous head of the republic M. Shaymiev received about 80% of the vote during his reelection campaign in 2001.<sup>14</sup> The paradox is that M. Shaymiev and the propresidential party could have won without election fraud, because more than half of the population supported these candidates. The bureaucrats' efforts only worsened their position and strengthened opposition to the candidates due to the falsification of election results. The local officials' behavior can be explained by their fear that unsatisfactory results would lead to punishments from the principal.

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<sup>13</sup> Central Election Comities of Kazakhstan, <http://election.kz/>

<sup>14</sup> Central Election Comities of Russia, [www.cikrf.ru](http://www.cikrf.ru)

For example, in the 2007 Russian parliament (Duma) elections, the “United Russia” party received a low percentage of votes in the Yaroslavl and Smolensk regions (33,13% and 29,56% respectively<sup>15</sup>). Soon afterwards, the governors of both regions were soon removed and placed into lower positions.<sup>16</sup>

## 2. Literature review

The economic analysis of dictatorship, the command plan economy, and special aspects of government under dictatorship has been addressed extensively in the field of economics<sup>17</sup>. At the same time, the problem of relationship between dictators and bureaucrats deserves greater attention. Papers that have shed light on this problem are summarized below.

First of all, we should mention the classical work “The Socialist System: The Political Economy of Communism”<sup>18</sup> by J. Kornai. In this book, the author poses the problem of bureaucracy in a command economy, including such aspects as conditions and constraints of bureaucracy work, characteristic features of coordination within this system, incentives for officials, enforcement mechanism, and different approaches to behavior of the bureaucracy managing the production of different goods. Moreover, a lot of material is devoted directly to plan confirmation and implementation procedure and relationships within the political machine. However, this work focuses on relationships between the party and bureaucracy after Stalin’s regime. Kornai examines established system of connections, institutes, and informal relationships, where all mechanisms of risk avoidance and slack maximizing were clear results of informal rules generally designed after Stalin’s death. In our article, we try to analyze principal-agent relationships in totalitarian dictatorship (for example Stalin’s dictatorship) if the power of dictator over his agents is almost unlimited.

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<sup>15</sup> Central Election Comities of Russia, [www.cikrf.ru](http://www.cikrf.ru)

<sup>16</sup> IA Regnum, <http://regnum.ru/>

<sup>17</sup> This subject became very popular in recent years. See, for example: 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 (which explains why many dictatorships create democratic or quasi-democratic institutions); Congleton, 2001 (which explains the presence of 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

<sup>18</sup> Kornai, 1992.

Wintrobe's well-known works<sup>19</sup> are usually devoted to relationships between the dictator's targets and his policies; according to them he created an almost universally recognized classification of dictatorships. Wintrobe also examines competition between bureaus as a source of dictatorship's comparative efficiency. His approach is strongly connected with our results, but in our model the officials' competition does not always lead to an effective (from dictator's point of view) result: sometimes the number of goods can be overproduced.

Among other classical research papers dedicated to this problem we should mention the works by Gregory, where the author investigates different characteristic features of the Soviet command economy during the 1930s. For example, some articles<sup>20</sup> 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 about plan coordination. The author pays attention to coordination, internal markets of bureaucracy and negotiation mechanisms (bargaining power) between different authorities.<sup>21</sup> In the articles the basic statements were proved<sup>22</sup>: the plan is an unimportant from the economic point of view document, the officials have a strong possibility and the possibility of officials to manipulate plan figures for resource redistribution.

Gregory, Schröder, and Sonin<sup>23</sup> observe mechanisms and reasons of mass repressions from the point of a rational dictator. The "principal-agent" problem and behavior of bureaucracy is beyond the scope of this research, but it puts emphasis on general patterns of dictator's behavior. Moreover, this work was used as statistical data source for analysis conducted in our article. The article by Sonin and Egorov<sup>24</sup> is devoted to agency relationship in totalitarian economy and features a model that explains why dictator prefers loyal agents to competent ones.

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<sup>19</sup> Wintrobe, 1990; 1998.

<sup>20</sup> Lazarev and Gregory, 2003.

<sup>21</sup> Belova and Gregory, 2001.

<sup>22</sup> 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.

<sup>23</sup> Gregory, Schröder, and Sonin, 2006.

<sup>24</sup> Egorov and Sonin, 2006.

Kalyagin and Sidorenko<sup>25</sup> propose models describing peculiarities of a dictator's behavior and comparison of the same actions under dictatorship and democracy. Although their paper accounted for criminal law enforcement under dictatorship, the article also describes some common mechanisms of enforcement and dictator's strategies to deal with his subordinated officials for shirking prevention. In other words, in case of punishment greater quantity of both innocent and guilty officials will get under repressions. We assume the same approach to the relationship between a dictator and his chain of command in this work.

### **3. The Model**

#### **3.1. Methodology**

We observe relations between the dictator and officials from subordinated bureaus belonging to different branches. The dictator and chiefs of the bureaus are rational economic subjects, maximizing their utility function. The logic of our research is based on the assumption that the economic model is a command one with state ownership of capital goods. Therefore, all of the resources are distributed by a central governor (dictator) among the state bureaus (agents), producing different homogeneous goods (in this type of economic model not only public ones) or services. It is also assumed that basic conditions of the central plan varies randomly among different sectors and bureaus.

In the model the dictator always makes the first step, and he sets the rules as well. In the model, the agents cannot guess the dictator's behavior a priori, even taking into account previous situations. For this reason, they only respond on the situation ex post facto. The bureaus have various strategies to optimize their welfare functions under different conditions set by the dictator (please see paragraph 3.3. below).

#### **3.2. Dictator's choice**

We assume that, according to the exogenously established plan, the dictator makes a final decision about resources allocation among the different bureaus in various branches. However,

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<sup>25</sup> Kalyagin and Sidorenko, 2007.

contrary to official claims, the dictator knows that the plan is not a reliable and scientific document. Therefore, the plan only represents the result of negotiations between various levels of administrative hierarchy, and only indicates an approximate quantity of resources available for allocation.

At the same time, the plan is not a direct signal for the dictator about his agents' performance. Therefore, he will use other criteria as an indicator of an official's conscientiousness, for example, the real output of the bureau<sup>26</sup>, multiplied by a special correction factor  $a_i > 0$ , reflecting reasonable differences in conditions between homogeneous bureaus. In other words,  $a_i$  is considered to be an indicator which shows a purity of signals to the dictator from the bottom.

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 become a subject of punishment. The dictator's task consists in definition of optimum quantity of  $m$  bureaus, which should be punished, from  $n$  selection. As a result, for each branch the dictator will choose an optimum share of victims equal to  $\frac{m^*}{n}$ . We assume that based on random nature punishment can overtake with probability  $q$  either shirking (guilty), or with probability  $r$  non-shirking (innocent) bureaucrat in objectively bad working conditions. The presence of an internal optimum  $m^* < n$  in the model is provided by several conditions:  $\frac{\partial q}{\partial m} > 0$ ,  $\frac{\partial r}{\partial m} > 0$ ,  $\frac{\partial^2 q}{\partial m^2} < 0$ ,  $\frac{\partial^2 r}{\partial m^2} > 0$ .

In other words, increasing the number of punished innocent bureaucrats would weaken incentives for high-productive work, causing output to decrease and the welfare of the dictator to decrease also.

From the dictator's point of view, incentive compatibility constraints for the official can be expressed as the following equation:

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<sup>26</sup> We assume that the dictator receives full information on results actually achieved by a bureau. In other words, in the given model, we suppose that he enjoys informational symmetry and assume that a bureau has no opportunity to be engaged in consensual distortions.

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

For a certain bureau  $i$ ,  $w_i$  is the output of the non-shirking bureaucrat,  $x_i$  is an assessment of shirking, expressed in physical units of produced good or services,  $c_i$  are the costs of produced unit for a given bureau  $i$ ,  $s$  shows sanctions (penalties) established by the dictator for the official (or officials) of a bureau  $i$ , if he estimates their behavior as shirking ( $a_i w_i < a_m w_m$ ). If we accept the precondition that punishment for the dictator costs 0, the choice of maximum heavy punishment will be optimum for him. As it will be shown below, such choice of the dictator is represented by a rather 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. Their distribution depends on various parameters, the exact estimation of which is connected for the dictator with restrictively high costs: fields of activity of a bureau, branch, complexity of work, certain function of costs for each bureau, etc. And the more is the scattering of  $a$  parameters, the more *ceteris paribus* is the probability of dictator's type-I enforcement mistake, so that he will refuse random mass repressions with greater probability, being afraid to dramatically decrease incentives for the further bureaus or branch output.

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

Where  $\frac{\partial m^*}{\partial \delta} < 0$ .  $\delta$  – 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 in 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 shapes the following form<sup>27</sup>:

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<sup>27</sup> We assume that the dictator pays his agents market wages. Wage does not influence on decision making by dictator, so it is not reflected in his welfare function.

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

Where  $b$  is a value for the dictator of a certain good or service (it is supposed to be a constant);  $v_i$  – the output produced by the bureaucrat  $i$ . It is important to notice, that the given parameter determines the output which is 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 the form:  $v_i = w_i - x_i$ .

Further,  $p_i$  is the plan for a bureau  $i$ ;  $c_0$  is a cost of one produced unit, it is supposed be the same for all goods and services, produced by a bureau;  $R$  - the premium for the plan fulfillment or overfullfilment<sup>28</sup>;  $k$  - number of the bureaus fulfilling or exceeding the plan, for which  $w_i \geq p_i$ .

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

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

The model that is presented in the article explains the historical phenomena. For example, in the metallurgical industry there were a small number of responsible officials and conditions varied greatly at the different enterprises. For this reason, the dispersion of parameters is expected to be high, and signals to the dictator are expected to be strongly distorted. Hence, optimum number of punished agents, from the dictator's point of view, is insignificant, and the plan figures were regularly decreased. On the other hand, the plan for repressions of Soviet "enemies" was issued to all bureaus of People's Commissariat of Internal Affairs system in administrative territorial districts of the USSR; conditions everywhere were approximately similar, and the procedure of checking up fulfillment (to count enemies) was a relatively easy

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<sup>28</sup>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.

task. In the case of regressions, the signals were clear and the dispersion was small, so fulfillment and overfulfillment of the plan could be expected. Further, we shall consider various strategies of agents' reaction to the incentives put before them by the dictator.

### 3.3. Official's choice

In this model we accept following preconditions:

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

2. If an official does not shirk, he spends all allocated resources for production of goods or services  $p_i c_0 = w_i c_i$ . So despite the 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 as granted. However, in behavior of the dictator there are many accidents, because the rationality of the main principle is assumed to be bounded.

4. Using certain resources, it is possible to arrange an increase or downturn of the plan in negotiation with other hierarchical pyramid participants.

In a general view the welfare function of the official in the certain branch will be presented as a following expression:

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

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 to be common for all participants of 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 form  $v_i c_i$  ( $v_i = w_i - x_i$ ).  $u \left( v_i \frac{m^*}{n} \right)^s$  is a possible punishment (validity is not important) which comes with probability  $u$  (thus probability depends on output and a share of punished in the given branch, please see above the 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  $p_2$ ;  $(p_2 - p_i)c_2$  - expenditures for increasing 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 many possible alternative behavior strategies.

There are three main variants of official's perception of the plan's size: 1) an "underestimated" plan (we assume that rational agents will never choose a strategy "plan decreasing" if it is already underestimated); 2) an "overestimated" plan (the official cannot fulfill it without shirking); or 3) an "exact" plan, which is fulfilled by the official if he chooses a fair strategy, and it is not fulfilled in case of opportunistic behavior choice. The official can also choose either shirking or non-shirking strategy.

In the article below we shall observe the optimal equilibriums for 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 without 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)
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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, the official would find it beneficial 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 (the choice depends on certain level of the parameters).

**“Exact” plan.**

In case when the plan fulfillment encourages fair behavior of an official with premium  $R$ , it makes sense to struggle for the plan reduction (if the official does not shirk). The results received by the official in this situation coincide with results which it receives for “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)

As a conclusion we should claim that according to external conditions, many strategies of bureaucrat behavior are possible under a dictatorship (in our case 15 different strategies). Different conditions explain various rates of existing plan delivery, agents’ attempt to change the plan, and the dictator’s sanctions for plan default. Finally, depending on the listed conditions, agents can have fair incentives not only for reduction of the planned figures established by the dictator, but also for their increase. In the case of political repressions, the strategies for increasing seemed to be dominant.

#### 4. Further research.

Analyzing the given model, it is necessary to pay attention to the problem of costs. If there were some alternatives of plan fulfillment, the cheapest one would probably take place. This hypothesis is partly proved by considering the historical example of mass repression: in 1937 after numerous procedures of scheduled norms increase, local officials exceeded the plan

by executing 386 798 people. In this case, the total number of repression victims exceeded planned targets (767 397 total victims vs. 753 315 in the plan)<sup>29</sup>. If we assume that for an official, decision making is usually guided by costs, the mentioned behavior is reasonable. For example, the costs of execution are less than the costs of imprisonment or the costs of transportation to a detention center. Thus, the general plan was implemented due to the increased percentage of persons executed and the reduced percentage of persons sent to prison. So, plan fulfillment with fewer costs (and even overfulfillment, reducing expected costs of punishment for officials) occurred due to extension of a cheaper production output.

Examining from the same position the results for dekulakizations and repressions against nations (please see paragraph 1.1., we draw the conclusion that cost analysis is important and sometimes crucially required for modeling strategies of officials' behavior. Using cost examination we can explain additional phenomena from an economic point of view. Therefore, our next research topic will be cost-beneficial research of bureaucracy behavior under dictatorship.

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<sup>29</sup> Source: Gregory, Schröder, and Sonin, 2006, p. 8.

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