Incentives for Corruption and Inertia in the Brazilian Civil Service: A Mechanism Design Approach[1]

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Abstract

The present paper analyzes the institutional incentives public managers face in Brazil. A decision-theoretic model suggests that the constitutional principle of "Legality" induces tenured civil servants to adopt a non-innovative, bureaucratic management style. On the other hand, temporary appointed managers tend to be more active, which could either generate higher social returns, in the case of socially inclined managers, or lower social return, in the case of managers involved in corrupt activities. A panel-data econometric analysis from 2002 to 2011 suggests that Ministries with higher percentages of temporary appointed managers tend to have higher corruption levels. A mechanism design modeling shows how institutions could be adjusted in order to stimulate a socially desirable innovative management while curbing corrupt practices in the country.

Keywords: Public management, the Legality Principle, Innovative management, Corruption

Introduction

Laws and their enforcement institutions (police, judiciary, regulatory agencies, etc.) provide a set of institutional incentives to citizens and corporations that affect the efficiency of economic transactions.

Although the First Welfare Theorem points to the superiority of market mechanisms, there are many economic situations that cannot be left to free market discretion and need to be regulated under the influence of the above-mentioned institutions. Taxation, for example, however unpopular, is necessary in order to finance non-profitable services for society, such as national defense, sanitation, preventive health, preservation of forests, etc. Moreover, there are some goods and services (education and health) that the free market mechanism can offer only for middle to higher-income classes; thus, they need to be provided to the low-income classes by the government. The government must also regulate monopolies and cartels that may jeopardize competition and generate distortionary costs and low-quality/high-priced goods. Such phenomena are well-known as "market failures" and refer to situations in which free market operations lead to socially undesirable results.

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As economic regulation disciplines market failures, legislation aims to curb other failures, such as those inherent to human beings' behavior. In other words, since rules intend to regulate life in society, they establish what is authorized or prohibited. In that context, the government may impose punishments in order to prohibit a given type of conduct. In fact, some laws aim precisely at hindering irregularities committed by civil servants that improperly expend the government's budget.

However, the laws and institutions designed to correct flaws and curb misbehavior have different degrees of quality. In other words, they can be effective in reducing problems; but they can also introduce additional distortions to the economy and society, thereby undermining the economic system's efficiency.

In Brazil, there are rather complex and rigid rules dealing with public affairs in the current legal system, such as the Law No. 8666 of 1993 (procurements and public contracts) and the Law No. 8429 of 1992 (management misconduct). These regulations aim at ensuring fairness in public management. However, they also impose many restrictions to public managers.

In its article 37, caput, the Brazilian Constitution expressly states that public management shall observe the principle of legality[4] in its activities. In other words, when public managers are acting on behalf of the government, they can only properly perform those activities that are clearly authorized by law. This is a very different reality compared to the private sector, where individuals have plenty of freedom to perform their management. Indeed, in the private sector the only restriction is to not commit acts prohibited by law. In summary, while private sector managers can do everything that is not prohibited by law, public managers can only do what the law explicitly grants.

In addition to the legal system, other institutions, such as the Public Ministry and the press, play a relevant role. They are constantly supervising the government under fiduciary duty or aiming at getting the scoop.

It is noteworthy that the functioning of institutions, which includes legislations, needs to be properly designed in order to contribute to the economic system's efficient coordination. In this respect, Douglas North, a renowned institutionalist author, defines institutions as "the rules of the game in a society or, more formally, humanly devised constraints that shape human interaction. In consequence, they structure incentives in exchange among men, be it political, social or economic" (North, 1990). Therefore, if institutions are too flexible, they may cause all sorts of abuses. Nevertheless, if they are overly rigid, they may lead to excessively cautious behavior by individuals in a given society.

Society itself increasingly demands efficient use of public resources. Citizens expect the government to provide high quality services and apply taxpayers' resources rationally. As a consequence, several recent studies focus on assessing the quality of public management, as described, for example, in Abrucio (2007).

The main objective of this article is to evaluate the incentives generated by institutions on civil servants' behavior. In particular, we want to answer the following questions. Are the high levels of monitoring and conditionality impeding innovative management, thereby limiting efficiency in public admnistration? Are

[4] The authors thank Tomás Bugarin for pointing out this essential distinction between public and private managers.

the hitherto established sanctions effective in restraining irregular practices in civil service? Or, notwithstanding the existence of restrictive legislation, are the sanctions unable to discourage dishonest conduct?

In order to answer these questions we first analyze the law and economics literature related to this topic. In particular we discuss various studies on corruption as well as on the role played by institutions and the legal system on the public sector's efficiency.

In light of the analyzed studies' contributions, we develop an economic model in order to evaluate the incentives faced by public managers in their professional environment. The model focuses on two points that distinguish an average public manager. The first characteristic refers to whether he is a tenured career or a temporary appointed civil servant. The second refers to the importance the public manager attaches to the social return of his professional activity. All things considered, the main objective is to forecast the public manager's conduct and evaluate what incentives fosters dedicated behavior and which favor an opportunistic behavior that involves the misuse of a his/her privileged position in the public sector.

The model's main result is that overly rigid rules tend to make the tenured career manager adopt a more cautious stance, avoiding to innovate and to make decisions that can be questioned in the future, which could lead to the loss of his public position. This result illustrates both a positive and a negative aspect. The positive is that the public manager will tend to be less involved in corruption. In contrast to that, the public manager will not be involved in innovative activities, which would imply higher contributions to social welfare.

Furthermore, the model suggests that in an environment guided by rigid rules the temporary appointed managers, not the tenured civil servants, will tend to take higher risks. These higher risk, however, can favor social welfare, when the temporary appointed managers attach greater value to the social return of their work, or it can favor illegal activities, when the managers attach greater value to their private gains.

The testable hypothesis that we derive from the formal economics of incentives model is that the higher the percentage of positions occupied by temporary civil servants in a Ministry, the higher the evidence of corruption in that Ministry. This hypothesis is econometrically tested and supported using data on the percentage of in "High Management and Advisory positions" (DAS in Portuguese) occupied by career civil servants in the executive branch between 2002 and 2011. In addition, data of "Special Accounts Audits" (TCE in Portuguese) initiated and sent to the Federal Court of Accounts of Brazil (TCU in Portuguese) is also used as a proxy for evidence of corruption.

In light of the theoretical and empirical evidence, the work uses the theory of mechanism design to evaluate which changes in the current legal system would set the right incentives for dedicate and innovative behavior of the managers while, at the same time, curbing corruption in the public sector.

We propose essentially two possible mechanisms. The first is not to punish public managers who adopt innovative behaviors that, although not prescribed by law, contribute to higher social welfare. The second is to, additionally, reward these

innovative managers. The models' analyses suggest that both mechanisms have potential to achieve the desired goals of encouraging innovation and discouraging corruption.

In addition to this introduction, the present article is divided in five sections. The first section refers to the literature review related to the topic. Section two builds the economic of information model, focusing on the incentives faced by public managers given the existing rules. Section three presents quantitative data that illustrate the reality of the current public management, along with econometric tests that reinforce the theoretical model testable hypotheses. Section four analyzes mechanisms that can be adopted in order to foster innovation and curb corruption. Finally, the fifth section presents the conclusions of the article.

1. Brief Literature Review

This paper focuses on two basic but conflicting aspects of public management. On one hand, institutions able to curb illegal acts related to corruption are extremely important. On the other hand, it is also essential to stimulate quality and efficiency of public spending.

Regarding the first aspect, it is useful to review a few studies that address the social impacts of corruption.

Del Monte and Papagni (2001) classify the reasons for practicing corruption in three broad categories: economic, political, and cultural. The economic reasons are chiefly related to illegal financial gains favoring the involved agents. Meanwhile, the political reasons result from the abuse of power by politicians who try to influence the allocation of public resources towards their areas of influence in order to garner votes for themselves and their party. Finally, the cultural reasons for practicing corruption are linked to beliefs, ideologies, religion, or social behaviors that contribute to the existence of tolerance toward corruption.

Paolo Mauro econometrically examines how economic growth is affected by corruption. The main results are as follows: there are incentives to reduce investments; society as a whole is less willing to contribute to philanthropic funds (donations); there are losses in tax collection; the winners of public bids offer low quality goods; and finally, there are higher amounts of government expenditure on large contract projects, instead of social spending, on areas such as health and education (Mauro, 1995).

Tanzi (1998) also argues that corruption jeopardizes the public sector's efficiency. Fraud in procurement auctions, for example, may lead to contracting a less efficient company, which probably reduces the returns of public expenditure and the productivity public investment. Furthermore, since a share of the government's spending is diverted toward individual gains, the effectiveness of government spending is diminished. In the Brazilian case, a comparative analysis made by Cândido Jr. (2001) concludes that the productivity of public spending is a mere 60% of the productivity of private sector spending.

Regarding the Brazilian experience, the ranking compiled by the International Transparency (http://www.transparency.org/), a nongovernmental organization, shows the national level of corruption compared to other countries. A score of zero

to ten is attributed to each country. In this respect, a score closer to zero indicates that a nation is perceived as very corrupt, while closer to ten indicates that the nation is perceived as a society with little corrupt. In order to distribute scores, International Transparency conducts researches with experts and executives of the evaluated countries. After establishing the scores, the NGO prepares the comparative ranking. In 2011, Brazil scored 3.8, a tenth higher than in the released report in 2010. In 2006, this score was 3.3. Although notes below five are considered as evidence of a high level of corruption, the data show a relatively significant improvement in time.

As any crime, corruption happens when benefits outweigh costs. The economic analysis of crime developed by Becker (1968) introduces a fundamental economic perspective: agents surely do respond to incentives. In this sense, Becker (1968) points out that the main reason to commit an economic crime (theft, robbery, extortion, larceny, smuggling, etc.) is the fact that risks involved are lower than potential benefits of illegal activities.

In addition to corruption, a high level of bureaucracy/regulation also appears to impair the quality and efficiency of public expenditure. In other words, inefficient public management may emerge from over-regulation. Indeed, when overregulated, public managers have to be so careful that innovative solutions are practically discouraged. In fact, the common knowledge about the Procurement Auction Law is that it forces public management to acquire low quality goods, since that law provides a rule imposing the purchasing at the lowest price. According to Fernandes (1999) this is a misconception. Fernandes, however, does recognize that most public managers fear severe punishments imposed by the Court of Accounts due to its previous decisions that have been misinterpreted.

Mendes (2011) points out that "the current bidding model, which favors the lowest prices, facilitates some malicious groups to win the bid; these corporations, without the required structure, receive payment in advance and provide low quality service with high probability of interrupting their activities due to lack of resources."

These findings concern the previously introduced argument that norms and judicial decisions have power to influence and model agents' behavior – a concept that characterizes norms in the literature as incentive structures. In that context, Andrés Roemer argues that the Economic Analysis of Law introduces a more abstract theory in which legal norms are viewed as incentives for action, while reactions depend on the involved incentives (Roemer, 2001).

In addition, Castro (2011) argues that "considering norms as incentive structures is the same as reckoning man as rational and preferences maximizers; in this sense, even in the presence of norms, human being tends to act according to cost and benefits analysis of their behavior. Therefore, the Law, through norms or judicial decisions, encourages or discourages certain behaviors in a society according to the costs and benefits that are set for specific actions". Particularly, overly rigid norms have the potential to discourage innovative behaviors of public managers on behalf of social welfare. Therefore, the public manager could prefer a lower level of social welfare than a higher one that would be considered unlawful.

In relation to filling posts at public administration, Mendes (2011) evaluates the admission procedures and human resources management at the executive branch.

The article seeks to offer suggestions for raising productivity; avoiding excessively admissions, improving quality of admitted civil servants; facilitating more efficiency on labor allocation and reducing the payroll cost. The paper highlights some aspects of temporary appointed civil servants.

According to Mendes (2011), it is clear that there shall exist the possibility of free appointment to higher managerial positions. It is essential to the public sector since these are the people who will give the government's policy guidance. However, regarding the lower managerial positions, the free appointment may be a distortionary mechanism, if it may be used as a partisan and political coalition formation tool. Therefore, in addition to the trade-off, which consists of impeding corruption or maximizing social welfare, another problem emerges from that situation: the different responses to institutional incentives taken by tenured civil servants versus those taken by temporary appointed civil servants.

The following section will further analyze these different incentives. The economic model will differentiate the incentives received by tenured civil servants and temporary appointed civil servants.

2. Economic modeling: incentives to dedication and corruption in civil service

2.1. The primitives of the model

In order to analyze the incentives faced by public managers, this article points out the existence of two different categories of managers. Managers from both categories occupy a Higher Management and Advisory position – referred hereafter as DAS[7] position as well as in the Portuguese acronym. The first category refers to tenured civil servants that occupy DAS (Category C); meanwhile the second refers to temporary appointed civil servants that also occupy DAS (Category T).

The main distinction between these two categories refers to their different wages (in present values): the tenured civil servants receive a wage w_C, whereas the temporary appointed civil servants receive a lower wage $w_T < w_C$. The difference between their wages models the fact that category C servants have job stability; therefore, they will not be fired unless they become involved in corrupt activities. Conversely, appointed managers T occupy temporary posts, which means that they can be fired at any time, and should lose their job when the corresponding minister's term ends.

All managers derive utility from their wages. However, the manager is also concerned about the social returns related to his performance, an aspect that does go beyond his wage. Here we assume that the more dedication and initiative from the manager, the greater the social returns generated by his performance. Besides the salary, the possibility to contribute for social welfare is one of the main reasons for citizens to pursue public careers.

[7] Section 3.1 further analyzes the DAS positions.

However, it is noteworthy that different individuals attach different values to their contribution for society, as well as to the private return received by occupying a DAS position. In order to simplify the analysis, we assume the existence of two types of managers, those managers that attach high value to their social contribution (type α_A), hereinafter referred to as "social manager"; and those who attach low value to their social contribution (type α_B), hereinafter referred to as "private manager", both measures compared to the value they attach to their private consumption.

Assuming separability and linearity in the two measures explained above, we can write the managers' utility as:

$$W + \alpha b_s$$

where W is the wage (in present value) received during all his life and b_s is the social welfare generated by his performance. Furthermore, $\alpha = \alpha_A, \alpha_B$ refers to the manager's type, i.e. the relative importance the manager gives to the social return of his management decisions, where $\alpha_A > 1 > \alpha_B$.

Note that W depends on many factors, such as the manager's category (C or T), thorough his wage w_G, $G=C, T$. Asides the manager's wage, the decisions made during his DAS exercising may also affect his income. The present model identifies three different possible decisions, which are explained below.

> Decision n: The manager does nothing that may incur in risk. This is a manager that fulfills his functions by carefully following all rules, regardless of the final social return. This kind of manager never makes risky decisions, even if his management generates a negative social benefit. This manager accepts, for example, to provide low quality products to society if the hired provider company has been properly selected and follows the established bureaucracy. In this case, $b_S = 0$; in other words, the social benefit generated by his management is normalized to zero without loss of generality.
>
> Decision s: The manager makes decisions that increase the effectiveness of public policies he oversees, even though those decisions may be questioned in court in the future. In this case, the manager will make decisions aiming at improving the social welfare. This manager will cancel procurement auctions in case of suspicion of collusion between participants, for example. Further, when there might be a high cost-benefit trade-off, he will not hesitate in hiring a company that is not under the properly bidding procedures. In order to achieve a higher social return, the manager dares to loosen the excessively rigid legislation. A $b_S > 0$ denotes the positive social benefits resulting from this kind of decision. However, the manager also faces a private cost related to the effort of dedication that results in high social benefits; this private cost is denoted by $\psi > 0$.
>
> Decision p: the manager makes decisions using illegal procedures in order to obtain private gains, in spite of the fact that there might be a future questioning in court and possibly a punishment. Corruption and public resources diversion are usually involved in those situations, which generate additional income to the manager. We denote this private gain as $b_P > 0$. We also assume, without loss of generality, that there are no social returns in

this case[8]. Similarly to the case of decision *s*, there is also a private cost to the manager, since he deploys efforts in the corrupt management. We assume, by simplicity, that it is equal to the private cost of dedicating oneself toward social welfare gains: $\psi>0$.

We also assume that $b_P>b_S$. In other words, the private benefits provided by corruption are greater than the social returns provided by a performance towards social welfare. Finally, we postulate that $b_P, \alpha b_S > \psi, \alpha = \alpha_A, \alpha_B$ i.e. the benefit of innovative actions for the manager are greater than their costs, whatever his choice or type might be.

Since decision *s* and *p* both transgress the current regulation, they imply a possibility of future questioning in court and a punishment. The punishment certainly leads to loss of the public office, which, in this model, occurs with a probability of $\pi\in(0,1)$. Note that in case of punishment, the manager's benefits, social or private, are not affected. It is also noteworthy that the situation in which the corrupt manager aims at private gains and the situation in which the benevolent manager aims at improving social welfare both have the same probability of punishment. Particularly, this feature aims at modeling the main problem emerging from the adverse incentives: in societies where there is a corruption legacy, rules to prevent corruption tend to be overly rigid. As a consequence, they affect the public managers' autonomy to make decisions that would best benefit society; of course, they would also affect decisions that would best benefit the manager itself.

In light of the exposed hypothesis, the utility of a manager of employment category *G* (*G=C, T*) and social type $\alpha= \alpha_A, \alpha_B$ can be expressed as a function of his decision, as presented below.

If decision *n* is made, the manager's utility is:

$$U(n;(G,\alpha)) = w_G \tag{2}$$

If decision *s* is made, the manager's utility is:

$$U(s;(G,\alpha)) = w_G(1-\pi) - \psi + \alpha b_S \tag{3}$$

If decision *p* is made, the manager's utility is:

$$U(p;(G,\alpha)) = w_G(1-\pi) - \psi + b_P \tag{4}$$

2.2. The managers' optimal decisions

We investigate now the manager's optimal action choice.

Since $\alpha_A>1>\alpha_B$, the manager who attaches low value to social welfare (the private manager, type α_B) will prefer to make decision *p*, instead of decision *s*; therefore, a manager of type α_B never invests in social welfare.

[8] Alternatively, it could be assumed a negative social return $b_S' < 0$. However, the result would be the same, and a high cost of one more variable in the model.

Similarly, the manager who attaches greater value to social welfare (the social manager type α_A) compares $\alpha_A b_S$ with b_P.

If $\alpha_A b_S > b_P$ then he prefers to dedicate to the risky activity that improves social welfare than to involves in illegal activities and take risk in order to improve social welfare.

If $\alpha_A b_S < b_P$ then the opposite preference realizes. In spite of the fact that he is geared towards the social benefit, the return of corruption are so high that he prefers to dedicate himself to illegal activities that increase his private benefits, rather the social welfare.

Given that Brazilian institutions have greatly improved and consolidated over the past decades, we assume here the latter case does not occur. In other words, a manager genuinely motivated by social return of his work will not get involved in corruption.

Let us now compare the choice between the proactive decisions *s* and *p* on one hand, and the inactive decision *n*, on the other hand.

Consider first the category *G = C*, *T* manager of type α_B. As can be seen above, the manager will choose between *n* or *p.* Comparing the utility in each situation, we have:

$$U(p;(G,\alpha_B)) > U(n;(G,\alpha_B)) \Leftrightarrow w_G(1-\pi) - \psi + b_P > w_G \Leftrightarrow b_P - \psi > \pi w_G \qquad (5)$$

Equation (5) clearly states the trade-offs. If the private benefit of corruption, net of the cost of that activity, outweighs the expected punishment, then the manager will dedicate to corruption making decision *p*.

Note that, since $b_P > b_S$ and $w_T < w_C$, it is the temporary (category *T*) private (type α_B) manager that is more likely to make the choice *p*. Furthermore, if that is the case that the tenured career (category *C*) private manager makes decision *p*, so does the temporary private manager.

Also note the role of the control institutions: the higher the probability of getting caught π, the lower the incentive to corruption. That result explains the emphasis the Brazilian government has been giving to improving the capabilities of the control institutions such as CGU (Controladoria Geral da União, General Comptroller of the Union) and the Federal Police.

To summarize, either the private-type managers of both categories do choose corruption, or only the temporary category chooses corruption whereas the career category chooses inertia (*n*), or both categories choose the bureaucratic decision *n*.

Consider next the category *G = C*, *T* manager of type α_A. As can be seen above, the manager will choose between *n* or *s.* Comparing the utility in each situation, we have:

$$U(n;(G,\alpha_A)) > U(s;(G,\alpha_A)) \Leftrightarrow w_G - \psi > w_G(1-\pi) - \psi + \alpha_A b_S \Leftrightarrow \alpha_A b_S - \psi < \pi w_G \quad (6)$$

Equation (6) is also clear about the incentives public managers face. If the net benefit of daring legislation in favor of social welfare is lower than the expected punishment due to being fired, the manager will choose *n*, the non-innovative and bureaucratic management.

It is noteworthy that, since $w_T<w_C$, the tenured civil servants will face greater incentives to make the decision *n* than the temporary civil servants. This result emerges from the fact that temporary civil servants have a lower (present value) wage. Also note the adverse role played by the controlling institutions: The higher the probability of punishment, the lower the incentive to make decision socially profitable decision *s*.

To summarize, either social-type managers of both categories do choose inertia (*n*), or only the temporary category managers invest in the social-welfare improving action *s*.

The following Proposition summarizes the analysis. Here, the managers' behavior is described according to their category and type, assuming that the model's parameters reflect a level of control π that is reasonably high but not high enough to completely curb corruption.

Proposition 1: Suppose that the preference parameters of managers occupying DAS posts (α_A, α_B) and the institutional parameters (w_C, w_P, b_S, b_P e π) satisfy Regularity Condition and Intermediary Incentives Condition below.

(RC) Regularity Conditions:

(i) $\alpha_A > 1 > \alpha_B$

(ii) $\alpha_A b_S > b_P > b_S$

(IIC) Intermediary Incentives Conditions:

(iii) $\pi w_C > \alpha_A b_S - \psi > \pi w_T$

(iv) $\pi w_C > b_P - \psi > \pi w_T$

Then tenured managers will not choose any decision that involves risk; consequently, they will not engage in corrupt activities, neither take innovative decisions that maximize the policies' social return (decision n). Conversely, temporary managers will take more risk. The social-type temporary managers will engage in social-welfare improving, innovative management (decision s). On the contrary, private-type temporary but private managers will engage in corrupt activities (decision p).

It is important to notice the crucial role played by institutions, which is reflected in the parameter π. Essentially, the more rigid and effective are these institutions (i.e., the higher π), the lower the incentives for managers to engage in corruption, but also the lower the incentives for managers to innovate aiming at improving social welfare.

One important consequence of the previous model is that managers that temporarily occupy DAS tend to take more risk. This suggests that there should be more incidences of misconducts in ministries in which there are a high percentages of DAS posts occupied by temporary civil servants. This is a clear testable hypothesis from our model. Next section presents an empirical strategy to statistically test that hypothesis.

3. Empirical Evidence

3.1. DAS and TCE

At the federal branch, positions that concerns to administrative decisions are filled as "Higher Management and Advisory" positions (DAS in Portuguese). DAS positions can be occupied by any civil servant or other citizens working for private sector.

However, Decree No. 5497, 2005, establishes that:

> Article 1: The following positions and levels DAS shall be occupied exclusively by tenured civil servants of direct federal management:
>
> I - seventy-five percent of DAS positions levels 1, 2 and 3, and
>
> II - fifty percent of DAS positions level 4.

DAS positions levels 1, 2 and 3 are those who have low decision-making power. Level 4 is for general coordinator. Level 5 refers to Department Director; finally, level 6 corresponds to Secretary of the Ministry. Note that there are no restrictions regarding levels 5 and 6 positions.

Figure I presents the percentage of DAS positions filled up by tenured civil servants at the Executive Branch from 2002 to 2011. In general, the average is about to 65%, but there is high volatility: the minimum percentage of tenured civil servants occupying DAS positions is less than 20% and the highest is about to 95%.

Note that there are significant differences between the ministries. Figure II presents the time series of five selected ministries. Three of them traditionally use more tenured civil servants to fill up management positions, contrasting with two others that fill up management positions using high percentage of temporary civil servants.

Note that ministries of Finance, Science and Technology for Development, Industry and Trade handle more complex subjects; further, they don't handle big infrastructure projects whish would involve large transfers of resources to the private sector. Perhaps these may be reasons for the DAS positions to be filled by tenured, more technical civil servants, which, in turn, suggest that there is less partisan rigging at these kinds of ministries.

Conversely, the Ministry of Tourism[9] and the Ministry of Sport[10] have the lowest percentage participation of tenured civil servants at DAS position. As noted in reports by the media, both ministries seem to be broadly involved in scandals of misuse of public funds.

That anecdotic evidence suggests an opportunistic behavior of civil servants that have a temporary connection with public sector. An analysis that identifies the

[9] On October 2011 O Estado de São Paulo reported that: "Operation Voucher, held by Federal Police, investigates irregularities at contracts between Ministry of Tourism and nongovernmental organizations. Around 36 people were arrested, top members of the ministry administration as well as directors of the Brazilian Institute for Sustainable Development (Ibrasi) are among them. A program, valued in R$ 4,4 million, developed to promote technical education at the state of Amapá would never have been executed.

[10] On November 2011 Folha de São Paulo published: "Since Orlando (Minister of Sports) withdrawn the ministry, the corruption crisis involving misuse of resources is toward the federal capital. Agnelo (2003-2006) (Federal District Governor) and Orlando (2006-2011) divided the ownership of the ministry of sports in recent years, within the quota that is from PCdoB (Communist Party of Brazil).

correlation between existence of corrupt activities and the level of DAS positions occupied by temporary or tenured civil servants in public management might allow us to test these suggestions.

Figure I

Occupation of DAS positions by tenured civil servants

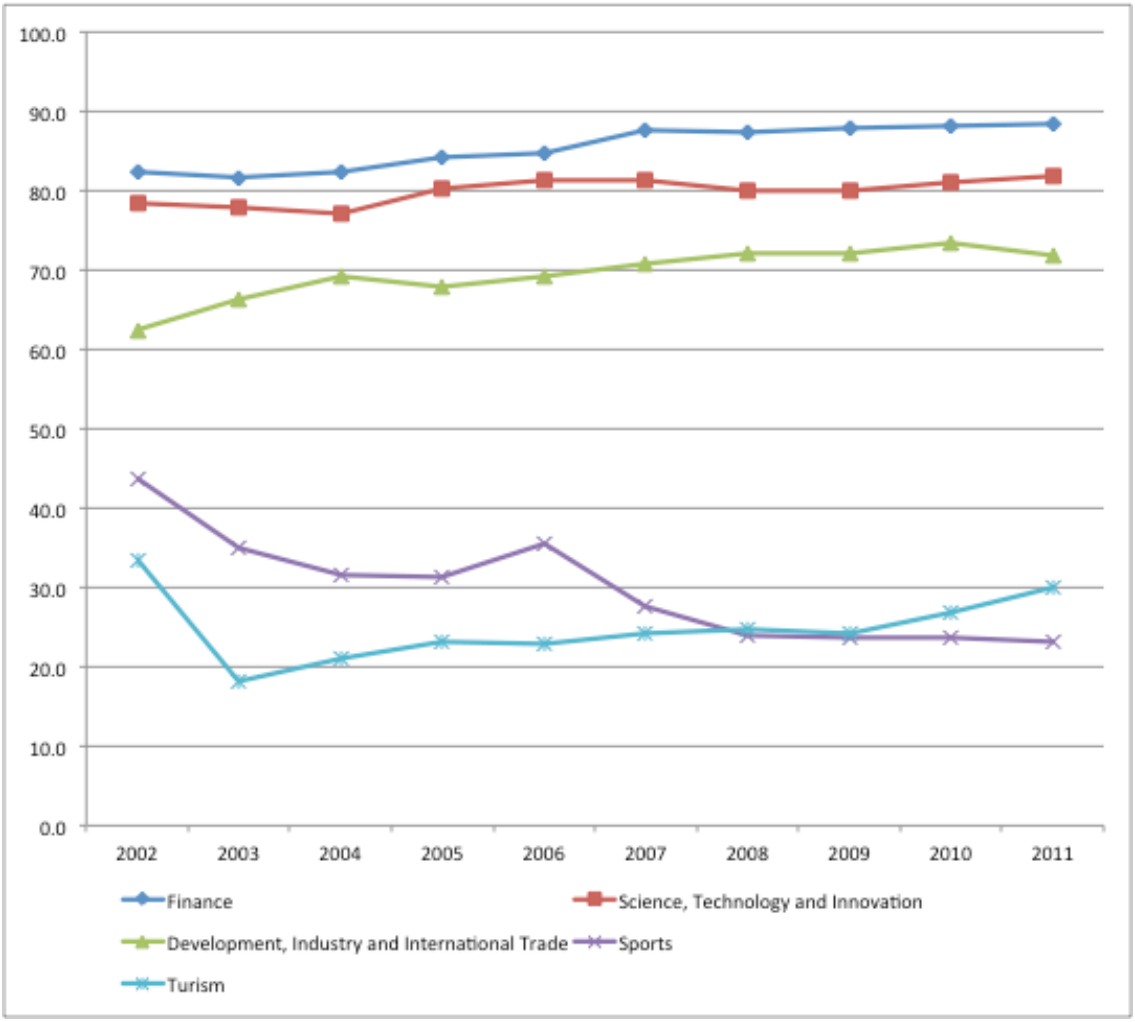
Ministry	Percentage of DAS filled with tenured career civil servants									
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Agriculture, Livestock and Food Suply	65.1	67.6	58.4	68.3	68.8	66.8	65.8	64.1	71.7	71.5
Science, Technology and Innovation	78.5	77.8	77.1	80.2	81.2	81.2	80.0	80.1	81.0	81.9
Culture	55.4	49.1	45.3	45.4	49.7	49.5	50.4	48.6	47.9	48.2
Defense	44.6	41.2	42.0	42.1	43.9	43.7	42.7	43.1	42.1	39.7
Education	56.5	51.5	52.3	56.2	62.7	67.0	65.7	62.7	65.9	67.4
Finance	82.2	81.7	82.3	84.2	84.8	87.6	87.3	87.8	88.1	88.5
National Integration	47.7	47.5	50.8	55.6	63.0	62.8	59.8	56.6	54.4	57.9
Justice	53.8	51.9	51.6	53.3	54.6	54.5	52.4	51.6	49.6	51.3
Fisheries and Aquaculture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.6	22.1
Social Security	91.7	91.3	91.2	94.2	93.5	90.2	90.5	90.9	88.9	88.6
Health	74.7	68.1	68.6	69.4	70.7	69.6	68.4	66.4	67.9	72.1
Cities	0.0	31.6	29.7	40.9	45.9	46.9	45.0	45.7	48.1	48.1
Communications	28.3	28.8	32.4	29.8	32.3	33.6	35.5	40.5	50.8	54.2
International Relations	94.8	95.3	94.8	93.6	93.2	93.2	92.8	92.2	91.6	91.9
Mines and Energy	50.9	39.8	40.9	42.4	46.8	47.2	46.6	47.3	44.7	47.2
Agrarian Development	65.7	54.2	54.3	54.3	59.7	61.5	60.2	60.3	61.7	63.8
Social Development and Anger Fighting	0.0	29.7	38.5	43.4	43.8	44.4	44.2	48.4	43.7	45.8
Development, Industry and International Trade	62.5	66.4	69.2	67.9	69.1	70.8	72.0	72.1	73.3	71.8
Sports	43.8	35.0	31.5	31.2	35.6	27.7	23.9	23.6	23.7	23.2
Environment	56.6	52.2	56.4	62.2	66.0	70.1	75.1	77.2	81.0	81.7
Planning, Budget and Management	68.4	67.3	65.2	64.6	66.3	67.1	66.8	66.8	67.3	67.3
Labor and Employment	61.5	55.8	55.0	58.5	62.5	60.8	63.2	63.8	65.2	68.1
Turism	33.3	18.2	21.0	23.2	22.9	24.2	24.7	24.3	26.9	30.1
Transportation	49.2	43.6	49.9	53.8	55.1	51.7	49.8	51.0	55.3	63.8
TOTAL	**66.2**	**61.6**	**61.6**	**64.0**	**65.2**	**65.5**	**65.0**	**64.8**	**65.0**	**66.5**

Source: Secretaria de Gestão Pública/Ministry of Planning

Figure II:

Evolution of DAS positions occupied by tenured civil servants:

Selected ministries



In order to quantify problems associated with corrupt activities, we use the number of Special Accounts (TCE) taken and sent to the Federal Court of Accounts (TCU). According to Article 63 of the Inter-ministerial Ordinance MPOG/MF/CGU number 127/2008, "The Special Accounts are the properly formalized process that aims at finding out the facts, identifying responsibilities and quantifying the damage caused to the Treasury seeking its immediate recovery."

It is noteworthy that, according to Article 3 of the Normative Instruction number 56/2007 of the Court of Accounts (TCU), before taking a Special Account, an audited entity's authority must exhaust all internal administrative measures in order to obtain the requested refund. Therefore, starting a TCE is an extreme measure that shows strong evidence of high probability of misuse of public resources.

Figure III was prepared using data from the General Comptroller (CGU). It consolidates the number of irregular accounts analyzed and sent from CGU to the Court of Audit (TCU) as Special Accounts (TCE).

Figure III
Number of Special Accounts taken by CGU and sent to TCU

Ministry	Number of TCE's sent to the TCU									
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Agriculture, Livestock and Food Suply	60	29	23	19	10	18	18	22	22	12
Science, Technology and Innovation	27	26	75	34	17	23	68	50	117	8
Culture	42	38	30	29	46	47	66	48	11	35
Defense										
Education	124	758	367	762	315	315	177	132	182	55
Finance	48	83	102	41	46	40	11	20	49	2
National Integration	55	42	75	110	74	99	79	59	77	101
Justice	7	6	14	12	27	70	6	4	5	8
Fisheries and Aquaculture										1
Social Security	46	50			2		5			8
Health	300	261	346	228	213	469	350	530	312	304
Cities		1	12		3	6	5	11	23	8
Communications	70	15	37	19	21	18	15	24	43	20
International Relations										
Mines and Energy	2			1				2		
Agrarian Development	9	4	11	5	9	19	10	46	33	19
Social Development and Anger Fighting			80	19	47	103	142	76	24	14
Development, Industry and International Trade	25	6	11	4	9	7	6	2	2	1
Sports	49	22	15	16	2	4	8	20	25	32
Environment	37	50	93	53	55	70	26	28	40	20
Planning, Budget and Management	9	13	239	260	213	118	30	22	43	34
Labor and Employment	2	4	3	4	37	26	19	162	52	27
Turism					7	6	18	15	25	18
Transportation	20	16	12	12	4	1	3	3	4	4

Source: Controladoria-Geral da União

Our goal is to test the hypothesis suggested by the analysis of the graph in Figure 2 comparing the number of TCE's in a ministry with the percentage of DAS position taken by tenured career managers. In order to perform the econometric test, we naturally expect that ministries with higher budgets will have higher opportunities to divert public resources, so that their number of TCE's is expected to increase. Therefore, we control for the budget size by dividing the TCE's variable by the ministry's implemented budget (in billions of Reals, the Brazilian currency) in the

corresponding year, which we call the TCEA (adjusted TCE). Figure IV below presents the corresponding values for the adjusted TCE.

Figure IV

Number of Special Accounts taken divided by implemented budget

Ministry	Number of TCE's by implemented budget (in billion Reals)									
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Agriculture, Livestock and Food Suply	15.41	6.86	6.84	4.52	2.23	3.85	3.39	2.48	2.74	1.48
Science, Technology and Innovation	12.99	9.78	25.49	9.47	4.18	5.07	13.14	8.58	15.68	1.22
Culture	151.48	138.30	80.84	56.98	73.71	60.59	70.98	41.47	7.74	22.48
Defense	-	-	-	-	-	-	-	-	-	-
Education	19.19	108.59	62.76	106.86	41.39	29.34	14.18	8.06	8.12	2.02
Finance	7.39	13.15	20.78	8.66	4.73	3.36	0.83	1.36	3.08	0.12
National Integration	11.14	9.86	14.07	16.25	11.05	10.11	6.69	4.34	10.46	20.85
Justice	1.92	1.61	3.27	2.58	4.74	10.04	0.72	0.45	0.51	0.84
Fisheries and Aquaculture	-	-	-	-	-	-	-	0.00	0.00	4.85
Social Security	0.49	0.43	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.03
Health	10.70	8.82	9.67	5.80	4.91	9.68	6.61	8.61	4.73	3.95
Cities	-	1.38	11.51	0.00	2.07	1.05	1.02	0.98	2.05	0.53
Communications	97.82	19.03	44.82	22.21	24.01	13.70	15.71	22.20	29.68	14.79
International Relations	-	-	-	-	-	-	-	-	-	-
Mines and Energy	1.58	0.00	0.00	2.73	0.00	0.00	0.00	5.66	0.00	0.00
Agrarian Development	5.93	2.52	4.84	1.72	2.75	5.00	2.96	12.19	8.86	5.09
Social Development and Anger Fighting	-	0.00	5.77	1.21	2.18	4.17	4.92	2.28	0.61	0.30
Development, Industry and International Trade	47.00	11.41	15.46	5.37	11.64	6.19	6.16	1.68	1.57	0.77
Sports	153.44	122.50	55.20	37.78	2.71	2.83	8.28	20.31	24.08	27.38
Environment	42.29	62.81	90.85	50.10	45.50	53.00	18.78	18.31	22.42	10.17
Planning, Budget and Management	6.17	8.43	144.87	158.95	96.17	31.99	9.63	5.91	8.38	8.60
Labor and Employment	0.13	0.23	0.15	0.17	1.33	0.84	0.54	3.84	1.11	0.50
Turism	-	0.00	0.00	0.00	4.86	3.37	7.62	6.03	10.56	13.76
Transportation	3.12	3.64	2.55	1.56	0.53	0.09	0.27	0.22	0.25	0.25

Source: Author's calculations

3.2. The dependent variable and explanatory variables

The dependent variable is:

> $TCEA_{it}$: Number of TCEs taken and sent to the Federal Court of Accounts (TCU) concerning ministry *i* in year *t* divided by the respective ministry's budget in billions of reals in year *t*. The TCE data were obtained from the Federal General Comptroller (CGU), while budget data were obtained from the National Treasury Secretariat (STN).

The explanatory variables are:

DAS_{it}: Percentage of DAS positions occupied by tenured civil servant at the ministry *i* in the year *t*. This data's source is the Department of Public Management of the Ministry of Planning. According to our previous discussions, we expect the coefficient for this variable to be negative.

$FUND_i$: the ministry *i*'s date of foundation category. According to the date of foundation of the ministry, there are three ministries' categories in the period covered by our econometric study. The first category refers to the older ministries, which were founded prior to 2002. The second category consists of ministries founded in 2003. Finally, the third category consists of ministries specifically founded in 2010. The variable FUND takes value of 1 for oldest ministries in category 1, 2 for ministries founded in 2003 and 3 for those founded in 2010. It is unclear what kind of signal this variable's coefficient should have. On one hand, older ministries have been subject to scrutiny for a longer time period; therefore, they are expected to have more TCE's. On the other hand, older ministries tend to have higher budgets, which may reduce the variable $TCEA_{it}$'s value.

$CONTROL_i$: In the fiscal federalism literature, there is a distinction between ministries mostly use public funds ("spending" ministries) and those ministries that aim at collection funds and controlling expenditure ("controlling" ministries). The controlling ministries are the Ministry of Planning, Budget and Management and the Ministry of Finance. CONTROL is a dummy variable that takes value 1 for controlling ministries and zero for the others. Given that one major concern of controlling ministries is the right use of public funds, this dummy's coefficient is expected to have a negative sign.

YEAR: This variable refers to the year in which the observation was made. It aims at determining whether there is a time trend of reduction of misuse of public resources. In an ex ante perspective, it is unclear which sign it must have. Indeed, if there has been widespread increase in corruption in Brazil over the past decades, one could expect a positive sign. However, considering that there has been an important institutional improvement in Brazil including the consolidation of control institutions, one should expect a negative coefficient for this variable. We take this more optimistic expectation.

Figure V summarizes the signs of the expected independent variables, whereas Figure VI presents the basic statistics of the relevant variables TCEA and DAS

Figure V

Expected signs of the explanatory variables

Dependent Variable	Expected Signal
DAS	–
FUND	?
CONTROL	–
YEAR	–

Source: Author's perception

Figure VI

Variable's basic statistics

Variable	Number of observations	Average	Standard Deviation	Minimum Value	Maximum Value
TCEA	229	14.55	27.91	0	158.95
DAS	229	58.14	18.93	18.2	95.3

Source: Author's calculations

3.3. Pooled Ordinary Least Squares Regression

Our first econometric analysis consists in regressing the dependent variable, on a constant and all independent variables, using a Pooled Ordinary Least Squares (POLS) regression. The Breusch and Pagan test indicates a statistic of χ^2 (1) = 125.77, which shows linear heteroscedasticity. Therefore, we use robust estimators in this regression. The results are shown in Figure VII. Hereafter, it will be used the symbol * referring to statistical significance at 10% level, ** for a 5% significance level and *** for a level of significance of 1%.

Figure VII
Method: Pooled Ordinary Least Squares

Dependent variable: TCEA	Coefficient	Robust standard error	t-statistic	P value
DAS***	-0,46	0,08	-4,93	0,000
FUND***	-18,68	3,43	-5,44	0,000
CONTROL	10,64	8,69	1,22	0,222
YEAR***	-2,18	0,64	-3,40	0,001
C***	4443,40	1293,52	3,44	0,001
Number of observations	229			
Ajusted R^2	0,1454			
F statistic	7,86			
Prob > F	0,0000			

*** Statistically significant at 1%

The POLS regression confirms that the higher the percentage of tenured civil servants occupying DAS positions in a ministry, the smaller the number of TCEA (TCE divided by the ministry's budget) sent to the TCU. This result is statistically significant at the 1% level.

FUND has a negative sign and it is significant at the 1% level. It means that ministries that were recently created tend to have a lower TCEA value. Considering that most new ministries typically have smaller budget, it might mean that newer ministries were created under stricter rules controlling management, which imply better use of public resources. However, we must be careful for the fact that most ministries are in the "older" category.

The coefficient of the variable CONTROL had an unexpected sign, but it has no statistical significance. It suggests that, in Brazil, control ministries are no more immune than others regarding to the misuse of public resources.

Finally, the negative and significant sign of variable YEAR suggests that Brazilian institutions are in improvement over the years in the country, which is a positive result.

The next section uses a panel data regression to test the robustness of the results found so far.

3.4. **Panel Data analysis**

Our data have a panel structure, since it is an observation of 24 ministries over a decade. Therefore, it is important to make some considerations about a panel data analysis in order to verify if it is a more properly way to analyze our problem. The Panel data approach automatically excludes the explanatory variable YEAR. However, it further explores the data's dynamic structure.

In order to properly compare the panel data method with the already used POLS method, the Lagrange multiplier of Breusch-Pagan is the most adequate test. It compares the POLS regression with the Random Effects Panel. The resulting statistic, χ^2 (1) = 117.75, rejects the null hypothesis of zero within group variance in favor of the random effects model. Therefore, a Random Effects Panel method is better suited than the POLS method.

Furthermore, it is also important to check what type of Panel regression is better suited to our data, the Fixed Effects or the Random Effects one. The Hausman test produces a statistics of χ^2 (1) = 0.06 with a Prob> chi2 = 0.8045. Therefore, the null hypothesis of random effects is not rejected. Thus, we conclude that a random effects panel data regression is most appropriate to our analysis. Figure VIII presents the corresponding results.

Figure VIII

Method: Random-Effects Panel-Data Regression

Dependent variable TCEA	Coefficient	Standard Error	t-statistic	P-value
DAS**	-0,44	0,19	-2,30	0,021
FUND**	-19,29	9,27	-2,08	0,037
CONTROL	11,20	13,60	0,82	0,410
C***	61,27	18,92	3,24	0,001

Number of observations:	229
R^2 within	0,0081
R^2 between	0,2055
R^2 overall	0,0953
Wald chi2(3)	6,88
Prob > chi2	0,0758

*** Statistically significant at 1% level
** Statistically significant at 5% level

Chart VI shows that the main results obtained from the POLS method remain robust when using the panel data model. In particular, the variable DAS has a significant negative sign, now at the 2% significance level. Therefore, we find here again that the more tenured civil servants occupying DAS positions, the smaller the number of TCEA'S occurrences in the ministry.

Similarly to the POLS model, newer ministries tend to be less questioned about their use of public resources. The estimated coefficient of -19,29 for FUND suggests that there is a qualitative improvement in the institutional design of new ministries. It also has a significance level of 1%.

As in the former analysis, there is no distinction between controlling ministries and spending ministries regarding the evidence of diversion of public resources.

Finally, it is noteworthy that the coefficients of variables DAS and FUND are very similar in both econometric models, which suggests that our result is robust. Particularly, a 1% increase in the percentage of DAS positions occupied by tenured civil servants implies a reduction of almost 0.5 TCEA (TCE per unit executed budget).

The theoretical and empirical evidences both suggest that the legal regulation, especially the Principle of Legality, has an adverse effect on public manager's behavior in Brazil. This suggests a discussion on how institutions could be amended in order to curb the incentives for inertia and corruption. The following section uses the mechanism design modeling to present a few possible solutions to these adverse incentives.

4. Aligning the incentives: A mechanism design approach

The results found above can be very pessimist. They show that the current legislation tends to inhibit tenured civil servants to proactively act on behalf of society, it gives them incentives to adopt a bureaucratic posture, which implies low social returns. That institutional equilibrium suggests the following questions. Should society accept inefficient public outcomes? Is there any possibility to change the legal framework in order to change incentives faced by social managers and private managers in order to engage social-type managers into promoting social welfare and curb private managers from engaging into corrupt activities?

This section is uses mechanism design to tackle these issues.

4.1. Protecting innovative managers

There is a natural way to motivate social-type managers to adopt an innovative and proactive posture, which consists simply of not punishing decision that benefits society. The new institution would world in the following way. In the same fashion in it done now, the control institutions would continue to monitor managers decisions. Suppose that, in executing their mission, control institutions uncover an innovative behavior not predicted by law, which occurs with probability π. If it is confirmed that such behavior generates social benefit, the innovating manager shall not be punished, i.e., the innovative and transgressor manager will not lose his job.

In such institutional environment, the utility of social managers that have a proactively and innovative performance on behalf of social welfare becomes: $U(b;(G,\alpha)) = w_G - \psi + \alpha b_S$. It is important to remember that $U(n;(G,\alpha)) = w_G$; In this case, the benefit provided by a proactively management outweighs the cost of effort ψ. Therefore, the tenured social manager will choose to adopt a proactive and innovative actuation. Hence, the problem of inaction is solved. Proposition 2 below explains this result.

Proposition 2. Assume that the parameters of managers' preferences occupying DAS positions (α_A, α_B) and the institutions (w_C, w_P, b_S, b_P and π) satisfy the Regularity

Conditions and also the Intermediate Incentives Conditions described in Proposition 1. Furthermore, suppose that, if controlling institutions identify an innovative behavior, but one that results in greater social benefits, then the manager will not suffer any punishment. Then, managers who attach high value to social welfare will dedicate themselves to an innovate performance on behalf of society, regardless of being a temporary or a tenured civil servant.

Proposition 2 shows that that a minor change in regulatory environment of public servants is sufficient to ensure a greater involvement of social civil servants towards an innovative and more efficient management. However, despite its theoretical simplicity, this change needs a constitutional amendment because it contradicts the previously discussed Principle of Legality. Moreover, this change does not affect the incentives to practicing corruption faced by private managers. The next section discusses further institutional adjustments needed curb corruption.

4.2. Aligning private managers' incentives

Absolving punishment in the previous analysis guaranteed a positive behavior of social managers. However, the incentives faced by managers who attach high value to private gains (private managers) are not modified when comparing inaction and corruption. Therefore, when the Intermediate Incentives Conditions *ICC* hold, those temporary and private managers will still prefer corruption to holding a bureaucratic management attitude.

What can we say about the incentives towards social welfare actions? Since now there is no punishment for socially benefic behavior, there are increased incentives for such management, even for the private-type manager. Indeed, by choosing *b* his utility becomes $U\left(b;\left(G,\alpha_B\right)\right)=w_G-\psi+\alpha_B b_S$.

There are clearly two conflicting incentives now faced by this type of manager. On one hand, the corruption activity provides a greater private gain: $b_P>\alpha_B b_S$. On the other hand, the expected present wage is lower: $w_G\left(1-\pi\right)<w_G$. If controlling institutions are well developed, the probability of being discovered π will be quite high. As a consequence, the wage effect will dominate the private gain obtained through corruption and private managers will choose to innovate on behalf of society as well.

Since this new rule not just cuts off the punishment of social managers, but it also controls the behavior of private managers, this is the best possible equilibrium. It is also noteworthy that, when there is no more punishment of social managers, the inertia of tenured managers is over, since their social dedication generates greater utility to them. Moreover, since temporary managers do not have incentive to practice corruption, tenured manager will not have either, since these are the ones who will lose most if they lose their jobs.

These results are summarized in the following proposition.

Proposition 3: Suppose that the preferences' parameters of managers occupying DAS positions (α_A, α_B) and the institutions' parameters (w_C, w_P, b_S, b_P and π) satisfy both the Regularity Conditions and Intermediate Incentives described in Proposition 1. Suppose, furthermore, that if control agencies identify an innovative management that results in greater social benefits, then the manager will not suffer any punishment, as in Proposition 2. Finally, suppose that the Condition of Institutional Consolidation described below is satisfied.

(CIC) Condition of Institutional Consolidation:

(v) $\pi w_T \geq b_P - \alpha_B b_S$

Then all public managers will innovate on behalf of society, regardless of their category and of their type. In other words, private, public, tenured or temporary managers as well will all adopt an innovative and proactive management on behalf of society.

Proof. Let us first show that a temporary manager of type α_B has incentives to innovate on behalf of social welfare.

If he chooses s, the manager's utility will be: $U(s;(G,\alpha_B)) = w_T - \psi + \alpha_B b_S$

If he chooses p, his utility will be: $U(p;(G,\alpha_B)) = w_T(1-\pi) - \psi + b_P$

Therefore, a private manager chooses s if $U(s;(G,\alpha_B)) \geq U(p;(G,\alpha_B))$*, which is equivalent to:* $w_T + \alpha_B b_S - \psi \geq w_T(1-\pi) - \psi + b_P \Leftrightarrow \pi w_T > b_P - \alpha_B b_S$.

But the above expression is exactly the CIC condition. Therefore, the temporary manager, who valorizes private returns, decides to devote to social welfare.

Consider now those tenured civil servants who value private returns. Since $w_C > w_T$*, then the CIC necessarily implies that* $\pi w_C > b_P - \alpha_B b_S$*, which in turn ensures that this kind of manager has even greater incentives to innovate on behalf of society.*

Proposition 3 describes an ideal situation; the non-punishment of innovative social manager jointly with highly efficient controlling institutions implies that the risk of being caught in corrupt management is high enough to guarantee that every manager will benevolently innovate on behalf of social welfare. However, this situation is not empirically corroborated; there is corruption among managers even in countries that have the most efficient controlling institutions, which suggests that this kind of situation does not correspond to the reality.

If so, what could do a country in which the overly optimistic hypothesis of *CIC (v)* does not hold? Firstly, it is important to note that even if *CIC* is not satisfied, the non-punishment of managers that choose *s* ensures that no manager will choose the inaction *n*. Indeed, social managers, be they tenured or be they temporary, both choose *s*. On contrary, private managers that are tenured will choose *s* while private managers that are temporary choose *p,* whenever *CIC* is not satisfied.

In order to avoid private managers taking the corrupt decisions *p*, the legal system shall make the devotion towards social welfare more attractive, which would

counteract corruption temptations. It could be easily done by rewarding a manager whenever an innovative management is caught and a social benefit is verified. This mechanism clearly involves a cost to the government. It corresponds to an awards' payment that we denote by *l*, which will be calculated below.

In order to discourage a temporary and private manager to engage in corrupt activities, the following condition is necessary:

$$U\left(s;\left(T,\alpha_B\right)\right)+\pi l \geq U\left(p;\left(T,\alpha_B\right)\right) \Leftrightarrow w_T-\psi+\alpha_B b_S+\pi l > w_T\left(1-\pi\right)-\psi+b_P$$

The above expression can be written as:

$$\pi\left(w_T+l\right) \geq b_P-\alpha_B b_S \tag{7}$$

In expression (7), the expected return regarding the bonus must compensate the expected loss in social investment jointly with corruption. Since the government wants to minimize costs, it will choose the lowest possible value for *l* that will discipline the manager. It is given by the following expression:

$$l=\frac{b_P-\alpha_B b_S-\pi w_T}{\pi} \tag{8}$$

Proposition 4 summarizes our findings.

Proposition 4. Suppose that the parameters of managers' preferences occupying DAS positions (α_A, α_B) and the institutions' parameters (w_C, w_P, b_S, b_P and π) satisfy the Regularity Conditions and the Intermediate Incentives Conditions described in Proposition 1, but also suppose that the Condition of Institutional Consolidation, described in Proposition 3, does not hold. Further, suppose that whenever a controlling institution identifies an innovative performance in which the results benefit society, then the manager does not suffer any punishment and, additionally, he receives a bonus for innovating, given by the amount in the expression below.

(vi) $l=\frac{b_P-\alpha_B b_S-\pi w_T}{\pi}$

Then all public managers will innovate on behalf of society, regardless of their category and of their type. In other words, private, public, tenured or temporary managers as well will all adopt an innovative and proactive management on behalf of society.

It is noteworthy that Proposition 4 refers to a quite audacious mechanism; the result of an inquiry can lead not only to the manager's non-punishment, but also to a reward, if the social benefit of the innovative management is verified. Furthermore, it is visible again that institutions play a crucial role: the higher the value of the parameter π, the lower the cost of implementing this mechanism will be. It is also noteworthy that there are several ways to implement such policy, some of which could be comparable to the type of productivity awards that have become more frequent in the Brazilian public sector.

5. Conclusion

This study discusses how institutions, the legal environment and public sector control organizations affect civil servants' behavior and, thereby, the efficiency of the public sector.

According to the theoretical model, the manager may decide between three different choices. The first is to adopt a bureaucratic and non-innovative behavior, which implies low social benefits; the second is to choose a proactive and innovative management style which benefits social welfare; finally, the third is to act in a corrupt way in order to obtain private gains. The solution to the decision-theoretic model shows that tenured civil servant managers tend to adopt the bureaucratic, non-corrupt, neither proactive management style. In contrast, temporary civil servant managers are willing to be more audacious. However, this extra boldness can be directed towards social welfare (for the social-type managers) or towards private gains (for the private-type managers).

These conclusions were tested using econometric models involving both the Pooled Ordinary Least Squares Method (POLS) and the Random Effects Panel Data econometric analysis. Both methods show evidence that the higher the percentage of tenured civil servants occupying DAS positions in a particular ministry, the smaller the evidence of corruption in that ministry.

An important aspect highlighted by the model is that deviating from the legally established rule implies a given punishment, regardless of the social effect of such deviation, i.e., regardless of whether it improves social welfare or is geared towards corruption. Therefore, a natural question that arises is whether institutions can be modified in order to assure better social return of public management. Such analysis is done here with the tool of mechanism design theory. We find here two important result. First, the mere abolishment of punishment when an innovative but socially beneficial action is confirmed, is sufficient to ensure that social-type managers will indeed dedicate their efforts towards the social welfare improving actions. That first institutional change, however, will probably not be strong enough to keep private-type, temporary managers away from corruption. In order to solve the corruption problem the government will have to resort to a second, more costly mechanism: it will have to actually reward those who, by their innovative behavior, generated social welfare gains. In that, if the reward is calibrated properly, the government will be able to curb corruption.

Note that even if the latter and audacious institutional change is not adopted, the simple non-punishment of social managers is sufficient to guarantee higher involvement of public managers towards social welfare.

These results suggest a discussion on how to create better incentives to public servants. The first one should focus on policies aiming at motivating the tenured civil servant, encouraging him to take actions that foster improvements in public management.

Fernandes (1999) addresses the civil servants' need of training; he argues, "it is not understandable how civil servants, who already are overloaded with multiple tasks, would properly comply with the current so complex legal system". Therefore, it is essential to promote greater interaction between controlling

institutions, such as the Comptroller General, Court of Auditors, Prosecutors and the rest of the public management aiming at relaxing the complexity of the legal system.

Another idea that aims at motivating tenured civil servants is regulating the possibility of employees advancing in their career through internal tendering. Indeed, currently tenders require high effort and preparation, but do not take much into account the worker's accumulated experience (Mendes, 2011).

The studied theoretical model also makes some contributions related to the current rigid legal system. On one hand, Brazil is strengthening control of public spending. On the other hand, more flexibility to the manager's performance could imply great benefits to society. Initially, this flexibility would encourage honest managers to innovate without fearing a punishment in the future. As a result, more managers that are honest would innovate towards social welfare, which means higher returns utilizing the same budget. Therefore, there is high efficiency gains in the use of scarce public resources.

Finally, there is a problem related to the way in which DAS positions are fulfilled. The best way is fulfilling them based on meritocracy criteria, instead of adopting political ones. One possible step in that direction would be to create a special committee that would announce the vacancy availability and the requirements to fill it (interviews, curriculum vitae, others superiors' letter of recommendation, etc.) (Mendes, 2011). This mechanism would facilitate finding out talents inside public management; furthermore, it would encourage the constant improvement and greater professionalization of the public workers.

To summarize, the main contribution of the presented study is to make explicit the incentives faced by civil servants. We hope that the modeling will be able to shed some light in the public policy's agenda and enrich the debate and discussions on how to more public services more professional and efficient.

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