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On the Institutional Incentives Faced by Brazilian Civil Servants

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On the Institutional Incentives Faced by Brazilian Civil Servants[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. Conversely, 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 brief econometric analysis from 2002 to 2011 suggests that Ministries with higher percentages of temporary appointed managers tend to have higher corruption levels. Then, the conclusion discusses how institutions could be adjusted in order to stimulate a socially desirable innovative management while curbing corrupt practices.

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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. 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. Furthermore, the government must 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 outcomes.

As economic regulation disciplines market failures, legislation aims to curb other failures, such as those inherent to human behavior. Hence, the government may impose punishments in order to prohibit a given type of conduct. In particular, 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 may 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 but 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 the only restriction is not to 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 whatever the law explicitly grants.

Although it is clearly understandable that public institutions should control public servants' behavior in order to curb corruption, that effort may also hinder their autonomy and initiative, so that a trade-off may arise. Indeed, if institutions are too flexible, they may cause all sorts of abuses, but if they are overly rigid, they may lead to excessively cautious and inefficient behavior.

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

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

The main objective of this article is to evaluate the incentives generated by control 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 administration? Are 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 briefly analyze the Law and Economics literature related to this topic in section 1. In particular we discuss various studies on corruption as well as on the role played by institutions and the legal system on public sector's efficiency.

In light of the analyzed studies' contributions, section 2 develops an economic model 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 which incentives foster dedicated behavior and which favor an opportunistic behavior that involves the misuse of a his/her privileged position in the administration.

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 could be challenged in the future and lead to the loss of his job. This result illustrates both a positive and a negative aspect. The positive aspect is that the public manager will tend to be less involved in corruption. The negative aspect is that the public manager may have reduced incentives to get involved in innovative activities that would generate 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 risks, however, can favor social welfare, when the temporary appointed managers attach greater value to the social return of their work; or they 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. Section 3 tests that hypothesis 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 on "Special Accounts Audits" (TCE in Portuguese acronym) initiated and sent to the Federal Court of Accounts of Brazil (TCU in Portuguese) is also used as a proxy for evidence of corruption. The preliminary econometric analysis supports the theoretic findings.

Finally, the paper briefly discusses how mechanisms could be adjusted to solve the adverse incentives singled out in the theoretic model.

1. Brief Literature Review

This paper focuses on two basic but conflicting aspects of public management. On one hand, institutions able to curb corruption are extremely important. On the other hand, it is also essential to stimulate the 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 that, in the presence of corruption: 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 public sector 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 of 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.

International Transparency (www.transparency.org), a nongovernmental organization, publishes a ranking of national level of corruption in different countries. The ranking gives a score from zero to ten to each country. A score closer to zero indicates that a nation is perceived as very corrupt, while closer to ten suggests that the nation is perceived as a society with little corruption. In order to distribute scores, International Transparency conducts researches with experts and executives of the evaluated countries. In 2013, Brazil scored 4.2, 0.5 points above the 2010 score of 3.7 and 0.9 points above 2006 score of 3.3. Although notes below five are suggestive of a high level of corruption, the data show a significant improvement over time.

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.

The concern with the adverse incentives faced by civil servants led to the development of a new focus on public management efficiency and effectiveness. “The administrations of Margareth Tatcher (England) and Ronald Regan (United States) were marked by the acceptance of conservative economic perspectives, a repudiation of liberal nostrums, and an alteration in accepted budgetary practices” (Farazmand, 2001). The new view of public administration was built on the now very familiar story of the post-World War II development of public choice, transactions cost theory and principal-agent theory, from the early work of Black and Arrow to Niskanen’s landmark theory of bureaucracy and the spate of later work that built on it (Hood, 1991).

As a result, over the past decades there has been a growing concern regarding quality and efficiency of public spending.

In Brazil too, significant changes have occurred in the public administration over the past decades (Paula, 2005): during the 90s, the Fernando Henrique Cardoso administration adopted a series of new policies, focusing on fiscal sustainability as well as increase in efficiency. The changes culminated in the formulation and implementation of the *Plano Diretor de Reforma do Aparelho do Estado* (PDRAE, Main Plan for State Reform), as well as the *Lei de Responsabilidade Fiscal* (Fiscal Responsibility Law). Recently, a new tendency has arisen with a new focus on public participation and transparency. New actions include participatory formulation of the *Plano Plurianual* (PPA, Multiannual Plan of Public Spending, at all three levels of government: federal, state and municipal). The increase in social participation of public spending decision-making is aimed at increasing efficiency, since society can identify main points of stress in development and is concerned with fiscal sustainability. The latest PPA (2012 to 2015) established a series of indicators aimed at monitoring and evaluation of public policies for every one of government's initiatives.

On the backside, Brazilian Procurement Auction Law forces public institutions to acquire low quality goods, since that institute provides a rule imposing the purchase at the lowest price. According to Fernandes (1999) this is a misconception. Furthermore, the institute may hinder more active behavior, since 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 procurement auction 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 support the idea that norms and judicial decisions influence and model agents' behavior – a concept that characterizes norms in the literature as incentive structures. As Roemer (2001) puts it, 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.

In addition, Castro (2011) argues that "considering norms as incentive structures is the same as reckoning man as rational and preferences maximizers; in that 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 (political) 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 that 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 further analyzes these different incentives faced by civil servants.

2. Economic modeling: incentives to dedication and corruption in the 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 Higher Management and Advisory positions – referred hereafter as DAS[5] positions as in the Portuguese acronym. The first category refers to tenured (career) civil servants that occupy DAS (Category *C*); meanwhile the second refers to temporary appointed civil servants that also occupy DAS (Category *T*).

[5] Section 3.1 further analyzes the DAS positions.

The main distinction between these two categories refers to their different wages (in present values): the tenured civil servants receive wage w_C, whereas the temporary appointed civil servants receive 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 moment, 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 the manager dedicates effort and initiative towards the social good, the higher the social returns generated by his performance. Besides the salary, the possibility to contribute for social welfare is, indeed, one of the main reasons for citizens to pursue public careers.

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

Assuming that agents' preferences are separable and linear 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 management decisions 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 bureaucratic rules. 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[6]. 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

[6] 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.

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 himself.

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 the manager makes decision n his utility is:

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

If the manager makes decision s his utility is:

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

If the manager makes decision p his utility is:

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

2.2. The manager's optimal decision

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.

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 get involved 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 than 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 previously discussed, the manager will choose between n or p. Comparing the utility in each situation yields:

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

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 take the 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 $\alpha_{A.}$ 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 that is 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 manager' behavior is described according to his 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. 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 the Regularity Conditions and the Intermediary Incentives Conditions 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). However, private-type temporary managers will engage in corrupt activities (decision p).*

It is important to notice the crucial role institutions play, 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 positions tend to take more risk. This suggests that there should be more incidences of misconducts in ministries in which there are high percentages of DAS posts occupied by temporary civil servants. This is a clear testable hypothesis from our model. Next section presents a preliminary empirical strategy to statistically test that hypothesis.

3. Empirical Evidence

3.1. DAS and TCE

At the federal branch, higher administrative posts are filled as "Higher Management and Advisory" positions (DAS in Portuguese). Any civil servant or other citizens working for private sector can occupy DAS positions.

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 have lower 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 above 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 percentages of temporary civil servants.

Note that the ministries of Finance; Science, Technology and Innovation; Development, Industry and International Trade handle more complex subjects; further, they don't handle big infrastructure projects which would involve large transfers of resources to the private sector. Perhaps this may help explain why tenured, more technical civil servants occupy DAS positions in these ministries, which, in turn, suggest that there is less partisan rigging.

Conversely, the Ministry of Tourism and the Ministry of Sport have the lowest percentage participation of tenured civil servants at DAS position. As noted in media reports (VEJA, 8/9/2011 and 10/26/2011), both ministries seem to be broadly involved in scandals of misuse of public funds.

Figure I

Occupation of DAS positions by tenured civil servants

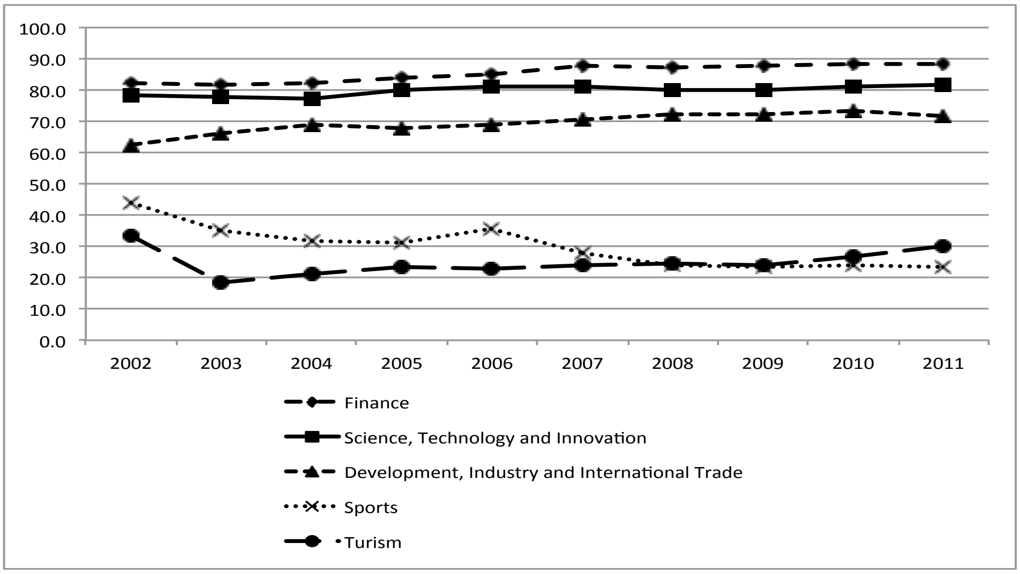
Ministry	Percentage of DAS filled with tenured career civil servants									
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Agriculture, Livestock and Food Suply	65.1	67.6	58.4	68.3	68.8	66.8	65.8	64.1	71.7	71.5
Science, Technology and Innovation	78.5	77.8	77.1	80.2	81.2	81.2	80.0	80.1	81.0	81.9
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
Tourism	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

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

Figure III

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, 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
Tourism	-	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

It is important to stress 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.

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. 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 III below presents the corresponding values for the adjusted TCE.

3.2. The dependent variable and the 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 the ministries that 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 improvement in Brazil including the consolidation of control institutions, one should expect a negative coefficient for this variable. We take this more optimistic expectation.

3.3. Pooled Ordinary Least Squares Regression

Our econometric analysis consists in regressing the dependent variable, on a constant and all independent variables, using a Pooled Ordinary Least Squares (POLS) regression[7]. 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 symbol *** express the fact that the estimators are significant at the 1% level of significance.

Figure VI

Pooled Ordinary Least Squares Regression

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

[7] We also run panel data analysis. The Hausman test produced a statistics of χ2 (1) = 0.06 with a Prob> chi2 = 0.8045, which suggested that a random effects panel regression should be used. We obtained similar results; in particular, a negative value for the DAS coefficient was found, significant at the 5% level.

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 indeed improving over the years, which is a positive result.

4. Conclusion

The present study discussed 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, a public manager may decide among 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 preliminarily tested using the Pooled Ordinary Least Squares Method (POLS), showing 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, due to the Brazilian Constitution's "Legality Principle", deviating from the legally established rules 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 can be developed with the tool of mechanism design theory. The corresponding development, not presented here for the sake of space, would yield two main insights. First, the mere abolishment of punishment when an innovative but socially beneficial action is confirmed would be sufficient to ensure that social-type managers would indeed dedicate their efforts towards the social welfare improving actions. That first institutional change, however, would probably not be strong enough to keep private-type, temporary managers away from corruption. In order to solve the corruption problem the government would have to resort to a second, costlier mechanism: it would have to actually reward those who, by their innovative behavior, generated social welfare gains. In that case, if the rewards were calibrated properly, the government would be able to curb corruption, at a cost.

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

The improvement of the theoretic model in order to include these institutional adjustment as well as further testing of the hypotheses generated by the model analysis are left here as suggestions for future extensions.

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