

IDENTITY, INCENTIVES AND THEIR DYNAMICS IN THE PRODUCTION OF
PUBLICLY PROVIDED GOODS

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Identity, incentives and their dynamics in the production of publicly provided goods*

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Abstract

An important issue in the literature on the role of government provision of goods and services concerns the understanding of inefficiencies related to the opportunistic behavior of public employees. This paper studies incentives in such contexts and analyzes the consequences of introducing a behavioral component into a model of agency within public organizations. In particular, we argue that employees may be motivated to provide effort in ways that enable them to shape their identity/self image. The term identity describes gains and losses in utility from behavior that conforms or departs from the ideal prescribed for particular social categories, such as being a “good” public employee. We develop a principal-agent model that incorporates identity, in addition to monetary rewards, and we show that when agents are guided by such intrinsic motivations, it may be optimal for the principal to choose a relatively inefficient monitoring technology and reduce monetary incentives. The mechanism leading to this result is related to the general equilibrium effect going through the public administration budget constraint. We then analyze a dynamic version of the model and show that a higher political instability may induce the government to adopt inefficient organization schemes that reduce the value of identity and negatively affect future provision of public services.

Keywords: Identity, Incentives, Public Goods Provision, Efficiency Wages, Public Service Motivation.

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1 Introduction

The role of government provision of valuable social goods and services is a highly debated subject in economics literature that throws up competing concerns. It is widely agreed that government intervention in the economy is justified from a welfare economics perspective, even if it may be a source of productive inefficiencies. One significant research topic concerns the understanding of public agencies failures related to the opportunistic behavior of public employees in the delivery of collective goods and services. The public choice approach raises the potential for government agents to exploit the power related to their office for private benefit at public expense, through the diversion of public resources to nonpublic purposes. A public enterprise might result inefficient from a productive point of view as a consequence of the misbehavior of public officials who, either legally, through the deviation from the normal duties and the minimization of the individual effort by slacking on the job, or illegally, through corruption and rent-seeking activities (like for example the appropriation of state property, the granting of favors to personal acquaintances, nepotism), pursue private interests acting against the public interest they should fulfill (Niskanen, 1977; Brennan and Buchanan, 1980; Shleifer and Vishny, 1993; Besley, 2006). This might lead government control and regulation of economic activities to negatively affect economic performance.

This paper intends to analyze optimal production schemes of public organizations in presence of agency problems when individuals may derive utility from their status. In particular, we evaluate the consequences of introducing a behavioral component into a model of agency within public organizations. We develop a theoretical framework that considers the interaction between monetary and non monetary incentives in motivating civil servants to adequately execute their tasks. We explicitly include in the workers' utility function sources of motivation that are alternative to monetary compensation and that have usually been considered by sociological and psychological studies. Specifically, we allow agents to be intrinsically motivated to provide effort in ways that enable them to conform to their identity or self-image (Akerlof and Kranton, 2000), in order to shape and reinforce it. The term *identity* is intended as self-perception, which is related to the view of the institution to which the worker belongs and to the role played therein.

Recent and growing economics literature focuses on the presumption that pecuniary remuneration is not the only kind of reward that individuals pursue. A field of research claims that the internalization of social norms and moral values can act as negative and positive sources of individual utility (Tabellini 2008; Bisin and Verdier, 2008; Kaplow and Shavell, 2007). It has

been observed that in many social situations or economic transactions individuals are inclined to behave not just considering the material gains they could obtain through an intertemporal calculation of costs and benefits, but also because they have internalized a norm of good conduct, on the basis of a logic of appropriateness and the adherence to socially prescribed roles. So people can refrain from stealing, cheating or shirking their duties even against their immediate material self-interest, just because of the idea they have about what is wrong or right, and the correspondence to this idea allows utility gain. However these studies do not involve public service performances and do not investigate the effects of value sharing among agents on the quality of public organizations.

The idea of a public service ethos as a source of incentive for civil servants has been long explored by public administration literature which refers to it as public service motivation (PSM) (see Francois, 2000 and Dixit, 2002 for an extensive survey on the topic). Perry and Wise (1990) define PSM as “an individual’s predisposition to respond to motives grounded primarily or uniquely in public institutions”, mainly because they ensure the provision of valuable social goods and services. Whether or not civil servants demonstrate proper ethics or motivation for their job has also been formally considered by economists over the past few years. Recent interesting contributions include Besley and Ghatak (2005), Benabou and Tirole (2006), Prendergast (2007), Delfgaauw and Dur (2010), Banerjee (2007), Frey (2008). These studies commonly consider civil servants as intrinsically motivated agents with a relative preference for working in the public sector, as government agencies are mission-oriented and serve social purposes that may enable them to develop a sense of commitment towards the tasks they must perform. As a consequence, individuals derive utility simply from the fact of working in public organizations and providing services to the community. Public workers get intrinsic benefits from the output of such agencies and, more generally, from the idealistic principle served by the agency and that they share. Akerlof and Kranton (2005) claim that when this sense of an employee’s attachment to a specific organization constitutes an intrinsic motivation consistent with positive self-perception, then it may successfully replace or integrate monetary incentives to motivate individual behavior. They use the term identity to describe how people see themselves and state that individuals form their identities by earning a reputation, by acquiring social status, or by developing a self-image. People are endowed with both a personal identity and multiple social identifications because they operate within a plurality of groups and social categories.¹ As individuals join an institution, their identity varies accordingly to

¹Sen (1985, 2002) observes that identity has important effects on the welfare, goals and norms of conduct of individuals. He argues that individuals develop a plurality of identities that are essential for their view of

the ideal of behavior associated to it, they identify with it and are motivated to provide effort in ways that enable them to conform to this image. As a result Akerlof and Kranton argue that identity-based incentives may be useful supplements to extrinsic/monetary rewards to mitigate agency problems. As long as work is important in determining the well-being of individuals, as a potential source of personal achievement and self-realization, an organization should rely on something other than pay to induce workers to perform well. This is more likely to be relevant for government agencies, where the effort of employees is difficult to observe or hard to remunerate, as they could be budget-constrained or unable to rely on efficient monitoring technology. Moreover, it is traditionally argued that workers who self-select in the public sector seem to be more risk-averse and less pro-market, guided by self interest and mainly concerned about a secure job and a safe retirement package (see Saint-Paul, 2011). For these reasons, public agencies represent an environment with limited scope for standard monetary incentive schemes, so they could more easily invest in inculcating a sense of identity among workers and persuade them to adopt the purposes of the organization, in order to prevent opportunistic or exploitative behavior.

Our paper is closely related to this field of research. Following Akerlof and Kranton (2000), we build a principal-agent model that incorporates identity as a source of civil servant motivation in the provision of effort, in addition to monetary rewards. We extend their framework by allowing the organization and quality of public service provision to affect the identity of the agents. The agent's effort is private information and, depending on the (endogenous) monitoring technology, it may be detected by the principal (government agency) with some positive probability. The level of publicly provided goods increases with the effort of the agents. We first determine the optimal organization of production, i.e. the monitoring technology and the effort required from the agents, when the government is benevolent and agents extrinsically motivated. We then consider the case where agents are heterogeneous in the preference for their identity. Depending on the individual characteristics and the technology employed, agents self-select into one of two different groups, "bad" and "good" workers respectively. Bad workers choose their effort according to monetary incentives only, while the good ones put effort according to the goals of the public organization and perceive intrinsic benefits from doing so.

We observe that more efficient monitoring technology (i.e., a higher probability of detecting shirking by agents) increases wages as well as the percentage of civil servants who self-select themselves and for their decision-making.

into the good category.² Nevertheless, for the principal the optimal solution is to choose a relatively inefficient monitoring technology, namely a technology with low levels of detection probability. This result is due to the fact that a lower probability of detection reduces the effort chosen by bad workers who consequently increase in number, which reduces the amount of public service provision. However, this also allows the principal to pay lower wages, which in turn increases the number of employees hired with positive effects on production (some of the agents hired are good and exert a high level of effort even if the wage is low). When there are many good civil servants, this effect dominates. We thus conclude that when agents are intrinsically motivated it may be optimal to reduce monetary incentives, as already emphasized by behavioral economics literature. However, the mechanism leading to this result is new and it is related to the general equilibrium effect going through the public administration budget constraint.

We also analyze a dynamic version of the model and characterize the optimal organization of production for a non-benevolent government. The analysis leads to the conclusion that a higher political instability may induce the government to adopt inefficient organization schemes that reduce the value of identity and negatively affect future provision of public services.

The remainder of the article is organized as follows. Section 2 describes the model, which is then analyzed in Section 3. Section 4 proposes a dynamic version of the baseline model. Section 5 concludes with possible directions for further research.

2 The Model

We present a principal agent model where the principal hires a number of agents to produce social goods. The production function is linear in the effort e of the agent. The output produced by each agent is $\tilde{y}_i = ke_i + \varepsilon_i$, where k is a positive constant and ε_i is a shock with zero mean and identically independently distributed across agents. As both principal and agents are risk-neutral, we will focus on the expected output of the relationship

$$y_i = ke_i. \tag{1}$$

The pecuniary cost of effort of the agent i is quadratic

$$c(e_i) = \frac{c}{2}e_i^2,$$

²This result seems to be at odd with the literature stating that monetary incentives may crowd out intrinsic motivation (e.g., Frey, 1997 and 2008; Bénabou and Tirole, 2006).

where $c > 0$ is constant and equal for all individuals. Effort is assumed to be observable and verifiable by the principal with some probability $p \in [\underline{p}, \bar{p}]$. The monitoring technology p is endogenous and can be chosen by the principal at zero cost. Individuals have no wealth and a limited-liability constraint operates, so that the agent caught shirking does not receive the wage w . To simplify the analysis, we normalize to zero the outside option utility of the agents.

We introduce a behavioral component into the agent’s utility function, such that civil servants are intrinsically motivated to provide effort in ways that enable them to earn self-esteem and to shape and reinforce their self-image/identity. We assume that agents can divide themselves into two role categories, “good” and “bad” civil servants, and they choose consequently the level of effort that allows them to conform to the ideal behavior prescribed by each category. The concept of identity as role category used here follows Akerlof and Kranton (2000, 2002, 2005), who discuss it in detail in their works:

“The term identity is used to describe a person’s social category - a person is a man or a woman, a black or a white, a manager or a worker. The term identity is also used to describe a person’s self-image. It captures how people feel about themselves, as well as how those feeling depend upon their actions. In a model of utility, then, a person’s identity describes gains and losses in utility from behavior that conforms or departs from the norms for particular social categories in particular situations. This concept of utility is a break with traditional economics, where utility functions are not situation-dependent, but fixed. In our conception, utility functions can change, because norms of appropriate and inappropriate behavior differ across space and time. Indeed, norms are taught -by parents, teachers, professors, priests, to name just a few. Psychologists say that people can internalize norms; the norms become their own and guide their behavior (Akerlof and Kranton, 2005).”

In other words, *identity*, denoted by I , describes both, a civil servant’s role category as well as gains and losses in utility from behavior that conforms or departs from the ideal prescribed for a determined role category, such as being a “good” public employee or a “bad” one. Specifically, good civil servants obtain an identity payoff I and their prescribed effort is the socially optimal level \hat{e} , namely the level of effort that would be chosen by the principal in absence of asymmetric information. The identity payoff and the prescribed effort of bad civil servants are both normalized to zero, so that their utility and behavior correspond to the standard neoclassical ones. Individuals differ in the utility derived from the role status of being

good civil servants depending on the match between their individual characteristics with the ideals for each category. Individual characteristics can be view as individual's prosocial values or an individual's natural inclination to honesty and civic virtues. We model this individual's characteristic with $h_i \in [0, 1]$. The prescription of an ideal good civil servant is $h_i = 0$, so that the identity payoff of agent i is $I^g - \gamma h_i$, where $I^g > 0$ and γ measures how difficult is for an individual with characteristics different from the ideal civil servant to fit in that group. To simplify the analysis, and without loss of generality, we also assume that a uniform distribution of h_i in the society, so that the density function is $s(h_i) = 1$ for all $h_i \in [0, 1]$.

The utility function of a good civil servant is

$$U_i^g = \alpha \left(w - \frac{c}{2} e_i^2 \right) + (1 - \alpha) \left[w + I^g - \gamma h_i - \frac{c}{2} (e_i - \hat{e})^2 \right], \quad (2)$$

where $\alpha \in [0, 1]$ denotes the weight attached to the pecuniary benefit, and $1 - \alpha$ the weight of the utility from the role status.³ Similarly, the utility of a bad civil servant can be written as

$$U_i^b = \alpha \left(w - \frac{c}{2} e_i^2 \right) + (1 - \alpha) \left[w - \frac{c}{2} (e_i - 0)^2 \right] = w - \frac{c}{2} e_i^2, \quad (3)$$

which corresponds to the standard neoclassical utility function.

The principal maximizes total output $G = ny$, where n denotes the number of agents hired, subject to the amount of resources T available by the principal for production (and that are used for the payment of wage bills only). We also assume that all agents have to put some positive level of effort. This may reflect the fact that the production is geographically distributed and it extremely costly for the principal having locations with no provision of services.

3 Characterization of the equilibrium

We start the analysis from analyzing the production of public services in the case where individuals do not derive utility from role status and, therefore, they all behave maximizing the standard neoclassical utility function (as the bad agents) reported in (3).

The wage that the principal has to pay to the (bad) agent in order to avoid him shirking, for any level of effort, is determined by the following incentive compatibility constraint

$$w - \frac{c}{2} e^2 \geq (1 - p) w, \quad (4)$$

³In modeling the agents' utility function, we follow Akerlof and Kranton (2002). Our formulation differs on theirs only for the presence of the salary w in the social status component of the utility function. While the results are unaffected by this variation, we prefer this formulation because it leads to the neoclassical utility function for the bad civil servants.

where the left hand side represents the utility of the agent from not shirking and the right hand side is the payoff from shirking. When shirking, the agent does not put any effort, he is caught with probability p and does not receive the wage, while with the complementary probability $1 - p$ his shirking is not revealed and he gets the wage. This implies that the efficiency wage reads

$$w^* = \frac{c}{2p}e^2, \quad (5)$$

which is increasing in the required effort and decreasing in the monitoring probability as expected.

The optimal level of effort for the principal maximizes net output, i.e., it solves the following maximization problem

$$\max_e ke - w^* = ke - \frac{c}{2p}e^2,$$

and it is equal to

$$e_b = p\frac{k}{c}. \quad (6)$$

This implies that the efficiency wage to be paid is $w^* = pk^2/2c$, and the utility of the agent in equilibrium is $U^b = (1 - p)pk^2/2c$. The normalization to zero of the outside option utility of the individuals implies that the participation constraint is never binding and the wage will be determined by the incentive compatibility constraint.

The total level of public services attainable is $G = ny = nke$. Taking into account that $n = T/w^*$, and using (5) and (6), we obtain that $G = 2T$. This means that in our framework without identity, the amount of public service provision does not depend on the choice of the monitoring technology represented by the level of p . These results are summarized in the following lemma.

Lemma 1 *When individuals do not derive utility from the role status (neoclassical benchmark), the total level of public services is independent on the monitoring technology employed p and it is equal to $G = 2T$. Each agent exert an effort $e_b = pk/c$ and is paid an efficiency wage $w^* = pk^2/2c$.*

We now analyze the optimal choice of the principal when individuals also choose their role status. The analysis concerning the efficiency wage and the optimal effort chosen by the agents who select themselves into the bad civil servants is unchanged. This means that the optimal effort level of bad agents is given by (6) and the salary paid by (5). Before moving to the analysis of the selection of identity, we need to determine the prescribed effort of good

civil servants \hat{e} , which is assumed to be the optimal effort level under symmetric information. Therefore, \hat{e} is the effort level maximizing the difference between output and cost of effort, $y - c(e)$, and the solution to the following problem

$$\max_e ke - \frac{c}{2}e^2.$$

From the first order condition follows that the optimal effort is

$$\hat{e} = k/c, \tag{7}$$

and the corresponding output is $\hat{y} = k^2/c$.

Under asymmetric information, the optimal level of effort of a good civil servant e_g is given by

$$\max_e U_i^g = \alpha \left(w - \frac{c}{2}e_i^2 \right) + (1 - \alpha) \left[w + I^g - \gamma h_i - \frac{c}{2}(e_i - \hat{e})^2 \right], \tag{8}$$

and it is equal to

$$e_g = (1 - \alpha) \hat{e} = (1 - \alpha) \frac{k}{c}, \tag{9}$$

where we have used the fact that \hat{e} is given by (7). The comparison of (6) and (9) shows that the effort level of good civil servants is higher than bad ones ($e_g > e_b$) as long as $p < 1 - \alpha$. In this case, the efficiency wage (5) that is paid to all agents is such that the incentive compatibility constraint (4) for good civil servants is not binding. When $p > 1 - \alpha$, $e_g < e_b$ and the incentive compatibility constraint, which should be rewritten using the utility in (8), could be binding. In this case there would be no distinction between good and bad civil servants (agents all exert the same effort), and the influence of role status is irrelevant. For this reason, we will restrict the attention to the case where $p < 1 - \alpha$.

We now move to analyze the optimal selection of individuals into the two role categories. An individual i will select himself into the good category if

$$\alpha \left(w - \frac{c}{2}e_g^2 \right) + (1 - \alpha) \left[w + I^g - \gamma h_i - \frac{c}{2}(e_g - \hat{e})^2 \right] \geq w - \frac{c}{2}e_b^2, \tag{10}$$

where e_g and e_b are given by (9) and (6) respectively. The left hand side of (10) represents the maximized utility of good civil servants and the right hand side the maximized utility of bad ones. Note that the maximized utility of good agents is decreasing in h_i which represents the distance of the individual's characteristics from the ideal one. Using (9) and (6), this condition can be rewritten as

$$h_i \leq \frac{I^g}{\gamma} + \frac{k^2}{2\gamma c(1 - \alpha)} [p^2 - \alpha(1 - \alpha)] \equiv h^*, \tag{11}$$

which means that all agents with $h_i \leq h^*$ find optimal to select themselves as good civil servants and those with $h_i > h^*$ will fall into the bad category.

The assumption of a uniform distribution of $h_i \in [0, 1]$ in the society and the fact that it is not possible to implement a separating equilibrium imply that h^* also represents the fraction of good agents. Moreover, the result contained in the following corollary is worth emphasizing.

Corollary 1 *The fraction of good agents h^* is increasing in p .*

Corollary 1 comes from the fact that a more efficient monitoring technology (higher p) makes optimal for the principal to require a higher effort to the agent (see (6)) and to pay a higher efficiency wage ($w^* = ce^2/2p = pk^2/2c$). Then, note from (10) that all agents get the higher wage but only the bad ones need to exert higher effort (remind that the incentive compatibility constraint is not binding for good agents, i.e., $e_g > e_b$ for all p). This implies that choosing to be a good agent becomes relatively more convenient when p is higher. The result suggests the existence of a complementarity between monetary incentives and intrinsic motivation.

The total amount of public service provision is now equal to

$$G = n[h^*ke_g + (1 - h^*)ke_b] = nk[h^*e_g + (1 - h^*)e_b]. \quad (12)$$

Substituting $n = T/w^*$, (5), (9) and (6) into (12), and rearranging terms, we obtain that the maximization problem of the principal can be rewritten as

$$\max_p G = \frac{2T}{p} [h^*(1 - \alpha) + (1 - h^*)p] \quad (13)$$

where h^* is given by (11).

In the Appendix, we show that the optimal monitoring technology is represented by $p^o = \text{argmax} \{G(\underline{p}), G(p^*)\}$ when $\underline{p} < (1 - \alpha)/3$, where p^* is implicitly defined by the following equation

$$(1 - \alpha - 2p)p^2 \frac{k^2}{2\gamma c(1 - \alpha)} - (1 - \alpha) \frac{I^g}{\gamma} + \frac{(1 - \alpha)\alpha k^2}{2\gamma c} = 0. \quad (14)$$

When $\underline{p} \geq (1 - \alpha)/3$, the optimal technology is $p^o = p^*$. As explained in the appendix, these results hold when the following condition is satisfied

$$\frac{(2\alpha - 1)k^2}{2c} < I^g < \frac{(1 + 26c)k^2}{54c}, \quad (15)$$

which means that the utility of the role status takes intermediate values. When the first inequality of (15) is not satisfied because the value from identity I^g is very low, $G(p)$ is

monotonically increasing in p for all $p \in [\underline{p}, \bar{p}]$, and the optimal monitoring technology is $p^o = \bar{p}$. Vice versa, when I^g is so high that the second inequality is violated, $G(p)$ is monotonically decreasing in p and $p^o = \underline{p}$. To simplify the analysis, in the remaining part of the paper, we assume that $\underline{p} \geq (1 - \alpha)/3$ and that condition (15) is always satisfied. This implies that the optimal technology is $p^* \in [(1 - \alpha)/3, (1 - \alpha)]$ implicitly defined by (14). These results are summarized in the following lemma.

Lemma 2 *When $p \in [(1 - \alpha)/3, (1 - \alpha)]$ and condition (15) is satisfied, the optimal monitoring technology is p^* implicitly defined by (14). The effort levels of good and bad civil servants are e_g , e_b and w^* are given respectively by (9), (6) and (5) with $p = p^*$, i.e., $e_g = (1 - \alpha)k/c$, $e_b = p^*k/c$ and $w^* = p^*k^2/2c$. The fraction of good agents is $h^*(p^*)$ as in (11), and the total amount of public services is $G(p^*) > 2T$ defined in (13).*

The main result contained in Lemma 2 is that the level of service provision is maximized for intermediate values of the monitoring technology. This is somehow surprising given the result in Corollary 1 that the fraction of good agents h^* is increasing in the efficiency of the monitoring technology p . The intuition for this result is the following.

A lower probability p of detection of shirking reduces the level of effort of bad civil servants as well as the share of good agents. Both effects lower the level of production of public services. However, this also reduces the (efficiency) wages and allows the principal to increase the number of agents hired (recall that $n = T/w^*$). A fraction of the additional agents will select into the good category and will then exert an effort higher than required. This effect increase the level of public services provided. When p is high, the fraction of good civil servants h^* is high and the latter effect dominates making optimal for the principal a reduction of p . When p is low, the fraction of good agents h^* is low and the former effects are likely to dominate, which in turn leads to an increase in p . When $p = p^*$ these two effects exactly offset each other.

We thus obtain the result that when agents are intrinsically motivated it may be optimal to reduce monetary incentives, as already emphasized by the behavioral economics literature. However, the mechanism leading to this result is related to a general equilibrium effect going through the public administration budget constraint and not to the reduction of the intrinsic motivations that higher incentives induce. We in fact obtain that higher monitoring and wages increase the likelihood that agents behave in a socially desirable way.

4 An extension: a simple two period model

We now propose a dynamic extension in two periods ($t = 1, 2$) of our baseline model where the value from identity is partly endogenous and there is political uncertainty. Our aim is to analyze how the organization of the bureaucracy may be affected by the interaction of the following two distinct features.

We now assume that the value derived by good civil servants from identity I^g is positively related to the share of good agents h^* in the previous period, i.e., $I_2^g(h_1^*)$ with $\partial I_2^g(h_1^*)/\partial h_1^* > 0$ and I_1^g exogenously given.⁴ This assumption may describe two distinct effects. The first one originates inside the organization. The higher is the fraction of agents who self-select into a certain category, and the more accepted and taken into a higher consideration becomes the behavior related to that category. The second effects is external to the organization and is related to the interaction between public institution and society. When society recognizes the high quality of the agency, the image of a good worker linked to the organization may be more valuable.

The other key feature of this model is the uncertainty about the future principal. In other words, we assume that the principal in period 1 will remain the same at time 2 only with some probability $\lambda < 1$. This may represent the existence of political instability, so that the party in power today may be replaced in the next period, which in turn leads to the change in the directors of the public organizations. Therefore, the maximization problem of the principal at time $t = 1$ is now

$$\max_{\{p_1, w_1, e_1\}} U_1^p = G_1(p_1) + \beta\lambda G_2(p_1, p_2), \quad (16)$$

where β is the discount factor. The dependency of G_2 on p_1 is due to the effect that p_1 has on the fraction of good agents h_1^* in the first period and therefore on the value from identity at time $t = 2$. The problem faced by the principal at time $t = 2$ is instead unchanged with respect to the static model presented in the previous sections. This means that the solution to the problem at $t = 2$ is described by Lemma 2, with the optimal monitoring technology p_2^* defined by (14) and the fraction of good agents $h_2^*(p_2^*)$ given by (11) with $I^g = I_2^g(h_1^*)$.

We are here interested in analyzing how the optimal organization of production of period 1 is affected by the degree of political instability, i.e., we want to determine the sign of $\partial p_1^*/\partial \lambda$. The solution to the principal's maximization problem at $t = 1$ involves choosing the monitoring technology $p = p_1^*$ solving (16), with the (minimum) effort level required to each agent and the

⁴The lag in the effect of economic outcomes on the value of identity is justified by the fact that it takes some time for the agents' beliefs to change.

efficiency wage given respectively by (6) and (5) with $p = p_1^*$. The first order condition of (16) is

$$\frac{\partial U_1^p}{\partial p_1} = \frac{\partial G_1(p_1)}{\partial p_1} + \beta\lambda \frac{\partial G_2(p_1, p_2)}{\partial p_1} = 0, \quad (17)$$

where we now have an additional component (the second term) with respect to the static problem. Then, note that

$$\frac{\partial G_2(p_1, p_2)}{\partial p_1} = \frac{\partial G_2(p_1, p_2)}{\partial p_1} + \frac{\partial G_2(p_1, p_2)}{\partial p_2} \frac{\partial p_2}{\partial p_1},$$

where the second component (indirect effect) is equal to zero from the first order condition ($\partial G_2/\partial p_2 = 0$) of the maximization problem at $t = 2$. In other words, by the envelope theorem, there is only the direct effect of p_1 on G_2 due to the effect of p_1 on $I_2^g(h_1^*)$ through h_1^* . Therefore, from

$$G_2 = \frac{2T}{p_2} [h_2^*(1 - \alpha) + (1 - h_2^*)p_2]$$

follows that

$$\frac{\partial G_2(p_1, p_2)}{\partial p_1} = \frac{2T}{p_2} [(1 - \alpha) - p_2] \frac{\partial h_2^*}{\partial p_1},$$

which is always positive as $\partial h_2^*/\partial p_1 > 0$ and $p_2 < 1 - \alpha$. Given that

$$h_2^* = \frac{I_2^g(h_1^*)}{\gamma} + \frac{k^2}{2\gamma c(1 - \alpha)} [(p_2)^2 - \alpha(1 - \alpha)]$$

and

$$h_1^* = \frac{I_1^g}{\gamma} + \frac{k^2}{2\gamma c(1 - \alpha)} [(p_1)^2 - \alpha(1 - \alpha)],$$

we obtain that

$$\frac{\partial h_2^*}{\partial p_1} = \frac{1}{\gamma} \frac{\partial I_2^g(h_1^*)}{\partial h_1^*} \frac{\partial h_1^*}{\partial p_1},$$

which is always positive since $\partial h_1^*/\partial p_1 > 0$, and $\partial I_2^g(h_1^*)/\partial h_1^* > 0$ by assumption. The following lemma summarizes these results.

Lemma 3 *In the first period of the model, the optimal monitoring technology p_1^* is the solution to equation (17) and $\partial p_1^*/\partial \lambda > 0$, which means that higher political uncertainty (lower λ) reduces the level of the optimal monitoring at $t = 1$. The minimum effort required to agents e_b , the efficiency wage w^* and the fraction of good agents h_1^* are still described by Lemma 2 with $p = p_1^*$ and $I^g = I_1^g$. The equilibrium of the model at time $t = 2$ is still described by Lemma 2 where the optimal technology is p_2^* implicitly defined by (14) with $I^g = I_2^g(h_1^*)$.*

As $\partial G_2/\partial p_1 > 0$, $\partial U_1^p/\partial p_1$ in (17) is increasing in λ , and this implies that the optimal monitoring technology p_1^* in the first period will also be increasing in the probability λ that the principal will remain in charge in the next period. This result can be explained as follows. A more efficient monitoring technology increases the fraction of good civil servants (see Corollary 1). This improves the future utility from identity I^g , so inducing more agents to select themselves as good in the next period. As good agents exert a higher level of effort, there will be more provision of public services for any given future technology chosen. This is especially valuable for the principal when there is a high probability he will be in office next period (i.e., when λ is high). In other words, the technology chosen today has an externality on future production, and the higher the probability that the principal is not replaced and the more he will take this effect into account.⁵ The higher the probability λ that the principal remains in office in the next period is high, and the higher will be the incentive to internalize this effect.

5 Concluding Remarks

In this paper we have investigated the optimal production of public organizations in presence of agency problems when individuals may derive utility from their status. In particular, our approach has critically relied on the idea that agents may be motivated to provide effort in ways that enable them to conform to individual and social values and beliefs attached to the status of civil servant, defined as *identity*, in addition to monetary rewards.

We have shown that when agents are guided by such intrinsic motivations, it may be optimal for the principal to choose a relatively inefficient monitoring technology and reduce monetary incentives. Moreover, a higher political instability may induce a (non-benevolent) government to adopt inefficient organization schemes that lower the quality of public agencies, reduce the value of identity and negatively affect future provision of public services.

Our analysis is complementary to other works emphasizing the importance of behavioral components for the provision of incentives in public organizations. In the framework proposed, intrinsic motivations and monetary incentives prove to be complements, but there might be general equilibrium effects that make it optimal to reduce monetary incentives as often observed in the public sector.

Finally, it is worth noting that the sense of civic virtue may be imparted by an *ad hoc* creation of specific institutions aimed at strengthening the identity of the public official, by

⁵A more efficient technology today (i.e., a higher p_1^*) translates into a higher future provision of public services (higher G_2) through the positive effect it has on the agents' incentives to behave as good workers and the level of utility attached to this category.

means of specific learning and training programs. Understanding the conditions under which this is feasible and optimal may also be important.

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