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Essays on Intrinsic Motivation and Conflict Inside
Organizations

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Abstract

The first chapter of this thesis explores the link between a government's political power and its choice between patronage and meritocracy in the recruitment and promotion of state bureaucrats. Evidence suggests that where political power is concentrated, governments are less likely to renounce patronage. A theoretical analysis suggests two reasons for this negative correlation. First, under patronage, governments can ensure bureaucratic competence only when they are powerful, while meritocracy guarantees competence regardless of the distribution of power. Secondly, a weak government introduces meritocracy to prevent the new incoming government from exerting its political influence over the composition of bureaucracy via patronage.

The second chapter (joint paper with Maitreesh Ghatak) examines why not-for-profits are most active in mission-based sectors and why they are able to attract more motivated workers. Francois (2000) argues that choosing not-for-profit status enables the firm's manager to commit to a hands-off policy, and consequently to use worker's intrinsic motivation more effectively. However, it can be shown that this is not always in the interest of the manager and that it is never in the interest of the worker. Not-for-profits only emerge if there is an oversupply of motivated labour.

The third chapter studies the role of political neutrality as a norm for state bureaucrats. The norm of political neutrality can be interpreted as an agreement to keep the bureaucrat's preferences hidden. Drawing on a theoretical analysis of the conflict of interest between bureaucrat and politician, this chapter shows that having no information on the bureaucrat's political views can improve the communication between politician and bureaucrat. This way, political neutrality can improve public decision making.

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Preface

When starting my undergraduate studies in economics, I was truly convinced that it best reflected my interests. My *interests* were, and still are, well described by the specialization I had chosen in my German A-levels: politics, mathematics and physics.

Not surprisingly, I was let down by my undergraduate programme. There was plenty of mathematics and even some reminiscence to the natural forces of physics. But politics rarely entered. Finally, after two years of study, I was confronted with the field of political economy. The course taught the classic models derived from ideas by scholars like Niskanen and Downs. The underlying view on politics felt frustrating. At that time, my mother worked as a public servant and my father as a member of parliament. Were they really just maximizing slack and votes? Had they fooled me so well with their political debates and rage over newspaper articles?

In the final stages of writing my doctoral thesis I suddenly recalled this feeling of doubt and puzzlement that I felt at the time. And I understood that my research takes a part of its motivation from that feeling ten years ago.

Introduction

The title of this thesis reflects two connecting elements, common to all the three articles that constitute this thesis. All three chapters introduce simple microeconomics models in order to analyze the effect of intrinsic motivation (broadly defined) on the interaction between individuals inside organizations. The three theoretical models borrow mostly from organizational economics and are then applied to discuss issues in political economy and development economics.

This thesis follows a single methodological approach. It observes existing institutions (bureaucracies and not-for-profit firms) and analyzes different aspects of their purpose and effectiveness. My goal is to construct the simplest possible models to capture essential elements of each studied institution. Using this approach, these papers suggest links between observable variables such as institutions, market characteristics, and macroeconomic variables. They thus lay ground for future empirical research.

At the outset, two limitations of this approach must be pointed out. First, the use of simple models might raise doubts about the generality of the suggested mechanisms. While a general model is a credible signal for a general mechanism, a model that uses specific functional forms is not. I/we tried to compensate for this lack of generality by critically reflecting on some of the underlying assumptions. Secondly, the theoretical predictions have not been empirically tested and therefore do not offer more than conceptual clarifications. Nonetheless, in order to demonstrate the relevance of the theory, the papers relate to existing empirical findings, where possible.

The first chapter of this thesis consists of my job market paper which explores the link between a government's political power and its choice be-

tween patronage and meritocracy in the recruitment and promotion of state bureaucrats. In this paper, I argue that institutions which govern recruitment and promotion within state bureaucracies, can be understood as a political state variable affected by the degree to which different groups in society have access to political power. Where political power is concentrated in the hands of one group, the system of political allocation of bureaucratic posts (patronage) has few disadvantages for the political elite. However, where political power is shared between different groups, patronage leads to an unpredictable bias in recruitment and bureaucratic incompetence. Under these conditions, the optimal choice for the incumbent would be to renounce patronage and introduce meritocratic recruitment. In order to illustrate this theoretical argument, I discuss the case of bureaucratic reforms in 19th century Britain. In addition, I present cross-country data to show that bureaucratic institutions and political institutions are correlated in ways predicted by the theory.

This paper contributes to the existing literature in several ways. To my knowledge, this is the first paper that explicitly models patronage and meritocracy as two sets of institutions governing recruitment and promotion in the state bureaucracy. The theoretical model developed in this paper could provide a micro foundation for related work in development economics that is more concerned with aggregate outcomes.[1] Moreover, the model allows for an analysis of the welfare effects of bureaucratic institutions. In particular, it explains why government decisions usually benefit from meritocracy. At the same time, the model also reveals that the efficiency costs attributed to political involvement in recruitment and promotion[2] could be dependant

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[1] For example Besley and Persson (2007) or Acemoglu et al (2006).

[2] See for example the evaluation of the Political Risk Services (www.prsgroup.com)

on the country-specific political environment.

The second chapter includes a paper resulting from joint work with Maitreesh Ghatak. The goal of this paper is to generalize the model of not-for-profit organizations by Patrick Francois (2000). In his paper, Francois shows that worker's intrinsic motivation in an organization can be crowded out if managers are too motivated to provide output in case the worker shirks. According to Francois, the reduction of financial incentives in not-for-profit firms will lead to the possibility of wage reductions. Building on his argument, our paper develops a simple sequential-move game to show that the link between not-for-profit provision and wage reductions indeed exists. However, we also show that the reduction of financial incentives is generally linked to a reduction of efficiency. If managers and workers can self-select into organizations, the not-for-profit setting is crowded out.

This result is not surprising given that Francois' assumptions do not actually imply *contractual failure* as defined by Hansmann (1980), i.e. a failure to write specific contracts between the manager of the firm and its patron. Rather, the contractual failure is an internal one between manager and worker. As a consequence, the not-for-profit cannot be regarded as a solution to a conflict between the goals of the organization and society but between manager and worker. Where this is indeed the case, the social value of not-for-profit firms might need to be reconsidered.

While this model might not apply generally, there are signs that the conflict between managers and workers in organizational choice is not unrealistic. In particular, the theory predicts that workers with low labour market power are more often found working for not-for-profit firms. As we show in our paper, recent empirical studies are compatible with this result.

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which seems to equate bureaucratic quality with bureaucratic independance.

This paper contributes to the existing literature since neither the theoretical finding nor its empirical implications have been noted elsewhere.

The third chapter explores the role of *political neutrality* as a norm for state bureaucrats, often associated with modern civil service institutions. In this paper, I suggest that the norm of *political neutrality* can be interpreted as an agreement to keep the bureaucrat's preferences hidden. The model shows that where these preferences are not revealed to the politician, communication between the bureaucrat and politician can improve sufficiently to justify *neutrality* from the politician's point of view. The underlying intuition of the theoretical finding is that the politician heads more to the advice that comes from a bureaucrat whose motives he does not know. This, in turn, makes the bureaucrat exaggerate less.

However, it can be shown that the politician always prefers to have a bureaucrat that shares his ideological views to not knowing the bureaucrat's type. This finding links the discussion in this chapter to the discussion about meritocracy and patronage in the first chapter. If competence considerations lead to the establishment of a permanent bureaucracy that is recruited without the influence of politicians, it might be useful to require the bureaucracy to remain *politically neutral.* In other words, once meritocracy is introduced (for reasons stated in the first chapter), political neutrality is the answer to the constrained maximization problem of a permanent civil service. This conclusion explains not only how *political neutrality* fits into a theoretical framework that takes political preferences as exogenous, but also why neutrality became much more important with the rise of civil service institutions. Both the specific theoretical argument and the application to bureaucratic institutions in this paper are unique.

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1 Patronage or Meritocracy: The Role of Political Power

1.1 Introduction

Recent research highlights the importance of institutions for economic welfare.[3] Governments play a central role in the provision of this institutional framework. Success, however, varies significantly across time and country. A natural starting point for understanding this variation is government itself. The largest share of government, regardless of the political system, consists of bureaucrats. Given their influence on policy-making it is likely that selecting competent bureaucrats is a good way to increase a state's capacity to further growth.[4] But while the selection method for politicians has received considerable attention, the selection method for bureaucrats remains under-researched.

Recruitment and promotion of bureaucrats can be broadly categorized into two different systems - patronage and meritocracy. Patronage gives the political leadership of the executive free hand in allocating government posts and firing staff. Under meritocracy, the political leadership cedes some or all of this power to a third party, usually a commission, that is supposed to select the most able candidate for a post. This article provides a theoretical framework to explain why a country adopts one system or another and whether this choice maximizes welfare.

We start by observing a simple regularity. Several Western European states introduced important building blocks of a meritocratic recruitment

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[3] Examples are Acemoglu and Johnson (2005), World Bank (2004), Djankov et al (2002), Glaeser and Shleifer (2002), Acemoglu at al (2001) or Hall and Jones (1999).

[4] See for example Page and Jenkins (2005), Dolan (2000), La Porta et al (1999), Evans (1995) and Wilson (1989) for related evidence.

system (a civil service commission, state exams etc.) in times of democratization. This historical pattern in Europe is matched by the existing cross-country data. Countries that recruit the heads of their executive through elections, tend to recruit their bureaucrats through state exams - political institutions and bureaucratic institutions are correlated. We interpret this correlation as a link between a high concentration of political power and the use of patronage.[5]

Our key assumption is that the bureaucratic system is a state variable that cannot be changed in the present. Hence, meritocracy effectively reduces the influence of future governments on bureaucratic recruitment and promotion. We show that this commitment to recruitment by merit is particularly attractive if the incumbent and his supporters are politically weak. One reason is that recruitment by a neutral commission is more desirable to him than recruitment by the opposition. Political institutions that give less power to specific groups therefore favor the introduction of meritocracy.

More importantly, perhaps, meritocracy improves competence in a situation in which power is shared between different groups. The underlying reason is that the disregard of group membership facilitates competition between candidates of diverging political views. Similar to politicians, bureaucrats are then motivated by the wish to implement their political ideas. Patronage, on the other hand, biases recruitment because politicians have an incentive to select candidates that match their political views. We show that this makes patronage surprisingly effective if political power is in the hand of just one group. It fails, however, if power is shared more equally.

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[5] We define political power as influence on the selection of state leaders. A high concentration of power implies that a specific group selects the government while a low concentration of power implies that different groups in society have an influence on the decision. A change from monarchy to democracy, for example, distributes power more equally.

In order to prevent confusion it should be stressed that *patronage* as defined in this article is not identical to the use of public employment to gather political support which is the usual definition in the existing literature.[6] Our analysis shows, however, that patronage as defined here (control over recruitment) can also have important effects on the political arena. If the political head of the executive recruits its bureaucrats then this increases the stakes in the selection of the head. This increase in stakes is a welcome stabilizing factor for governments with powerful support as it motivates their power base. If political power is shared more equally, however, increased stakes can become a destabilizing factor. A weak incumbent might therefore introduce meritocratic recruitment to reduce pressures for political change.

The theoretical framework also allows us to draw conclusions about the effect of bureaucratic structure on bureaucratic competence and welfare. While meritocracy is generally more efficient, it can be dominated by a combination of power monopoly and patronage. An analysis of the incumbent's choice shows that if the need for bureaucratic specialization is low, bureaucratic competence is reached by his choice. If bureaucrats need to incur high investments into competence to become effective, however, the incumbent's choice will be biased in favor of patronage. Weak common interests in society, high polarization and the importance of private benefits from maintaining patronage then all play a role in preventing meritocratic reforms. These findings seem compatible with some of the empirical findings in the development literature.[7]

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[6]See Enikolopov (2007), Acemoglu et al (2006) or Goldman (2003) for recent examples. For an early reference see Wilson (1961).

[7]For examples see Esterly and Levine (1997) and Besley and Persson (2007).

In summary, this article explains bureaucratic institutions through the distribution of political power and shows how the quality of bureaucratic decisions is affected. It is tempting to consider the resulting messages for the reduced form - the impact of shared power on economic performance. We show that shared power should go hand in hand with competent decision-making because it tends to increase the attractiveness of meritocratic institutions. The bureaucratic performance of power monopolies lies slightly above this benchmark if little specialization is required of bureaucrats but performs worse otherwise.[8] Incomplete sharing of power leads to inefficient bureaucracies if it does not lead to meritocracy.

The article is structured as follows. In the next section we illustrate our main argument using the example of reforms in 19th century Britain. The remainder of section 2 explains why we are hopeful that these mechanisms have power outside of the United Kingdom. In section 1.3 we present a brief overview of some related literature. Section 1.4 contains the basic framework and section 1.5 derives the main results. We conclude with a discussion of our findings in section 1.6.

1.2   Political Power and Bureaucratic Structure

The question of how to measure meritocracy is not straightforward. Two institutional features seem to be particularly important in this context: the use of entry examination in recruitment and restraints on arbitrary removal. While this is obviously not perfect, we will focus mostly on the introduction of entry exams as a sign of meritocratic recruitment.

We model political power as the influence of a group on government

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[8] This finding seems broadly consistent with recent findings by Besley and Kudamatsu (2007).

selection. We assume that the distribution of this power can partly be measured by observable institutional characteristics like free and fair elections or hereditary rule.

1.2.1 The Introduction of State Examinations in Britain

Within the range of possible systems for recruitment and promotion, the merit system in the United Kingdom is relatively radical when it comes to the application of the merit principle[9]. The starting point of institutionalized meritocratic recruitment in England lies in the 19th century.

At the beginning of the 19th century, patronage and sale of offices was common in Britain while objective indicators of competence or skill hardly played any role in recruitment. This is revealed in a minute of the treasury from the year 1820. The document stresses that men previously convicted of revenue offences should not be appointed as customs officials.[10] Amongst the benefactors of this system of patronage were the members of the parliament which represented the interests of the old and new upper classes.

The struggle for the introduction of the merit system began in 1853 when Charles Trevelyan and Stafford Northcote were asked by the then Chancellor of the Exchequer, William Gladstone, to write a report on its recruitment and promotion. In 1854, the Northcote Trevelyan report was published. On its first page, the report motivates the reform.

The great and increasing accumulation of public business, and the consequent pressure upon the Government, need only be alluded to; and the inconveniences which are inseparable from the frequent changes which take

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[9] See Frey (2000) for a striking comparison with the United States system.
[10] See Greaves (1945)

place in the responsible administration are matter of sufficient notoriety.[11]

The main aim of the proposed reforms was therefore to generate a body of permanent officers that was '*able to advise, assist, and to some extent influence those who are from time to time set over them*'.[12]

It is the emphasis of government change as a motive for reform that suggests a connection to political reforms at the time. With the rising power of the parliament in the nineteenth century, the prerogative power of the crown had come to be increasingly taken over by ministers who were held accountable by parliament.[13] At the same time, parliament itself was undergoing revolutionary change. It had received more powers and following the first reform act in 1832 it had become more representative in the sense that the middle classes had gained the right to vote.

In summary, the timing of British reforms and the arguments of Northcote and Trevelyan indicate a link between a more broadly shared access to the executive, increasing volatility and a reduction in quality of governance. Which factors were responsible for this link? There are some signs that the reformers of the 19th century were particularly concerned about the effect of political influence in distorting recruitment.

This becomes clear with a more detailed look at the British reform debate. An integral part of this debate, involving scholars like Mill and Malthus, were the ongoing reforms in the East India Company. A central aim of these reforms was to improve bureaucratic performance by decreasing the influence of the British political elite on recruitment. Describing what he believed to be recruitment and promotion by merit in the East India

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[11] Northcote and Trevelyan (1954), p. 1 (reprint)
[12] Northcote and Trevelyan (1954), p. 1 (reprint)
[13] See Finer (1956) for an early discussion.

company John Stuart Mill[14], for example, argues

A second great advantage of the present system is, that those who are sent out as candidates to rise by degrees are generally unconnected with the influential classes in the country, and out of the range of Parliamentary influence. The consequence is, that those who have the disposal of offices in India have little or no motive to put unfit persons into important situations [...][15]

It is the motive to recruit *unfit* persons that seems to be a key ingredient in making patronage a bad choice. Meritocratic promotion was seen as a way to improve competence in this context.[16]

Whatever the merits of meritocracy, the application to the administration in Britain faced considerable resistance. Northcote and Trevelyan had proposed to modify recruitment procedures through the introduction of an entry examination for all public servants, administered by an independent Board of Examiners. Unsurprisingly, one of the strongest opponents of this new way of recruitment was the parliament.

Due to the high resistance to the reforms, their implementation took considerable time. Patronage persisted despite the foundation of a civil service commission in 1855 and state exams were not introduced until 1870 - after a second extension of voting rights in 1867. One interpretation of the timing of events is that the still relatively rich members of parliament

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[14]See Ryan (1972) for a revealing account of John Stuart Mill's arguements and his influence on the Northcote Trevelyan report.

[15]J.S.Mill, cited in Ryan (1972), p. 44

[16]How little in this fact seemed to have changed over the years is revealed by a recent report by the UK House of Commons Public Administration Select Committee. The report concludes: *On a purely utilitarian basis, there remains a strong case for an impartial civil service. In Northcote Trevelyan terms, even when appointment from outside becomes routine, able people are encouraged to apply to the public service because they know that appointment will be on merit, not by patronage.* Politics and Administration: Ministers and Civil Servants. Third Report of Session 2006-07, p. 26.

feared that the control over recruitment could fall into the hands of the lower classes.[17] When pressures to extend voting rights grew in the mid 1860s, the members of parliament preferred to transfer powers to the commission.

Following this interpretation, the merit system was endorsed by parliament because it kept recruitment out of the grasp of a future government with different policy preferences. This seems to add a separate argument to the concerns of competence and efficiency stressed by Northcote and Trevelyan. We will show that both arguments are connected to the distribution of political power.

1.2.2 Empirical Evidence

Table 1 (p. 56) summarizes some of the time-lines in the introduction of the civil service in Western Europe. While the correlation between crude indicators of changes in political power and the merit system is not straightforward, the introduction of state examinations always coincides with political changes leading to a significant increase in political competition. The example of Spain is particularly striking as meritocracy was introduced in the relatively chaotic political environment of the 1910s but later reversed under dictatorship.

A similar relationship seems to be at work in the United States (US). Ruhil and Camoes (2003) show that electoral competition was a key predictor of adoptions at the state level. One standard deviation in closeness more than doubled the chance that a state adopted competitive state examinations between 1900 and 1939. Horn (1995) argues that US presidents expanded the merit system when oppositional groups were about to gain political influence.

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[17]Gowan (1984) makes this point.

Turning towards patterns in the cross-section there is some evidence that a broad participation in formal power is not only correlated with the use of state exams but with de-politicization more in general. One striking example can be found in the summary of a detailed analysis of eight Asian economies in Burns and Bowornwathana (2001). In their summary, the editors develop an informal ranking of politicization. The ranking of politicization coincides perfectly with political system - the three well-established democracies in the sample exhibit the highest degree of bureaucratic autonomy.[18]

Data gathered by James Rauch and Peter Evans offers the opportunity to take a more systematic look at the relationship between the merit principle and shared formal power. Their data-set is based on a standardized survey conducted with leading civil servants in 35 countries[19] that asks respondents to give an estimate of what proportion of higher officials in their agency entered the civil service via a formal examination system. The resulting index gives the average answer score for each country ranging from 1 (less than 30 percent) to 4 (more than 90 percent). This data is matched with measure of political institutions from the PolityIV data set in the 1970s. The index we use categorizes the system of executive recruitment in selection and election[20]. The association between these political institutions and the use of state exams is displayed in figure 1. It reveals a relatively high use of state exams in countries which feature elections.[21]

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[18]India, Japan and South Korea have the most autonomous bureaucracies. Bangladesh, Philippines and Thailand rank moderately in terms of bureaucratic politicization. China and Laos exhibit considerable restrictions in bureaucratic autonomy.

[19]For its small sample size, the dataset is very diverse. Africa, America, Asia and Europe are all equally represented.

[20]The index also features mixed systems and countries that have no regulated way into the executive. We drop these observations. Mixed systems are included again in the regression analysis to gain more sample size (4 countries).

[21]Table 2 (p. 57) confirms that political institutions (selected, mixed, elected) are a relatively strong predictor of the use of state exams in this small sample of countries. The
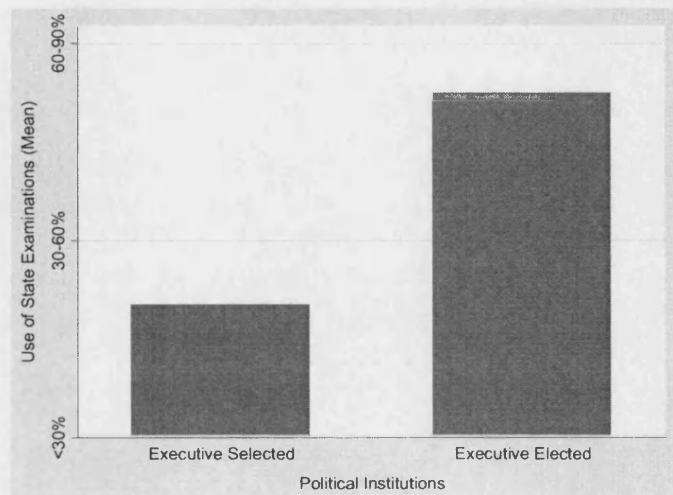
Figure 1: Political Institutions and the Use of State Exams

The simple correlation is confirmed by data provided by the Political Risk Survey Group. The group provides a measure of *bureaucratic quality* for more than 100 countries that measures the degree to which the bureaucracy of a country is permanent, independent and has its own established mechanism for recruitment and training.[22] Again, the mean of bureaucratic quality is systematically lower in countries in which the executive is selected.

Given the unobserved heterogeneity and measurement error problems we do not think these correlations between elections and prevalence of the merit principle should enjoy too much confidence. However, to the extent

index also stays significant when controlling for legal origin, ethnic fragmentation and GDP per capita (1980). Splitting the indicator for the political system up into its sub-

and selected governments less.

[22] The exact wording on their website www.prsgroup.com is: *High points are given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services. In these low-risk countries, the bureaucracy tends to be somewhat autonomous from political pressure and to have an established mechanism for recruitment and training.*

that the results in table 2 (p. 56) are not driven by any of the econometric concerns, they confirm a complementarity between broadly shared political power and low political involvement in bureaucratic recruitment.

1.3 Related Literature

Bureaucracies are important for economic outcomes. The fact that much of the empirical work uses some indicator of bureaucratic performance[23] to measure institutions is indicative of this importance. A more direct way to measure the importance of bureaucrats is to look at their involvement in policy making. Page and Jenkins (2005) give a detailed overview of the activities of UK officials. Their interviews found that 50 percent of officials in their sample were involved in policy production.[24] Similar evidence for the members of the Senior Executive Service (SES) in the United States is provided by Dolan (2000) whose results suggest even higher rates of involvement. Again, bureaucrats do not only implement but propose and initiate policies themselves.

There are few studies that try to show that bureaucratic recruitment matters for outcomes. Two exceptions are the cross-country study by Rauch and Evans (1999) and a study by Nistotskaya (2007) for Russian states which confirm a positive effect of meritocratic recruitment on outcomes like corruption, competence and regional growth. While both works face the usual econometric concerns of cross-sectional work they are at least indicative of a role for meritocracy.

A natural starting point for a theoretical inquiry into the role of bureau-

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[23] These are, for example, the difficulties in resolving the case of unpaid commercial debt, time and cost of registering a business or the ability of the state to gather taxes.

[24] Page (2003) describes in detail how this involvement entails drafting whole pieces of legislation.

crats is recent work by Alesina and Tabellini (2007). Building on the career concerns model of Holmstrom (1999), they analyze the comparative advantages of politicians and bureaucrats in different policy tasks. Their model can be used to explain variations between patronage and meritocracy[25] because bureaucrats recruited in a patronage system share the re-election incentives of politicians while bureaucrats under meritocracy fit well to their description of bureaucrats. However, there are two problems with a direct application of their findings. First, their model predicts that an increase in political accountability increases the bureaucrat's effort under patronage but not under meritocracy.[26] If elections imply accountability this should associate them with patronage not meritocracy. Secondly, our main goal is to explain why politicians might prefer one bureaucratic system over another. This is not identical to the normative question of which system is more efficient.

Another closely related work is Maskin and Tirole (2004). They model the choice of an electorate amongst three institutions: direct democracy, representative democracy and judicial power. Both representative democracy and judicial power have the advantage that they allocate the decision to an informed agent. Under representative democracy, however, this agent has a dynamic incentive to *pander* to the voter. Similar to Morris (2001), accountability therefore creates a loss of information. Judicial power is chosen over representative democracy if the loss of information is more important than the weeding out of nonaligned decision-makers.

A similar trade-off is used in Hanssen (2004) to explain the introduction

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[25] Two empirical enquriries that relate to this approach are Enikolopov (2007) and Rauch (1995).

[26] De Figueiredo (2002) uses a similar argument to show that the 'insulation' of the bureaucracy is a problem.

of judicial independence. His work is closely related to this article as he introduces a model that captures the effect of political competition. In his model, an incumbent chooses judicial independence if the judge hired today is sufficiently aligned compared to a judge chosen by a future government under judicial dependence. He argues that both increasing re-election chances and rising polarization make judicial independence more attractive for an incumbent. The resulting model is complementary to the one discussed here as it captures the role of firing restrictions - the second pillar of meritocracy next to recruitment and promotion by merit. However, his model does not offer any insights into the effects of institution on competence.

Competence considerations, however, might be important for evaluating bureaucratic performance. Max Weber's ideal type bureaucracy, for example, has specialized knowledge at its core.[27] We support this notion by showing that competence might be a decisive welfare criterion in evaluating bureaucratic structures. Our analysis ignores the issues of control that specialized knowledge might entail.[28] What remains is the problem of selecting competent bureaucrats.

We assume that the problem of selecting bureaucrats is complicated by the existence of different political views. An important element of political preferences is that they affect the effectiveness of a given match between politician and bureaucrat.[29] This relates our analysis of bureaucrat selection to Besley and Ghatak (2005) who use similar arguments to explain the role of a mission oriented sector in the provision of some services. An important

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[27]First published 1922. For a description see Weber (1988), section III, paragraph 4.

[28]This problem has been analyzed in detail by Aghion and Tirole (1997) and Dessein (2002) for example.

[29]Some evidence that this motivation might be important is provided by studies like Aberbach et al (1981), Edwards et al (1981) or Aberbach and Rockman (2000) or the discussion in Wilson (1989).

difference is that bureaucrats in our model derive some of their political motivation from political conflict. Political conflict as an incentive is well established in the analysis of politicians.[30] We show here that meritocracy can put similar motives to a productive use in bureaucracies.

Conceptually, this article relates to the discussion of the strategic manipulation of political state variables.[31] State debt, for example, is shown to be higher if the future government has a different preference for how it spends public funds. We argue here that the bureaucratic system can be regarded a political state variable. A problem with this application is, of course, that re-election likelihoods are likely affected by institutional choices. It is therefore necessary to model the re-election process explicitly.

1.4   The Model

In what follows, we develop a model that relates political power, bureaucratic structure and bureaucratic quality. In particular, we analyze the behavior of two candidates who compete for a post inside the bureaucracy by investing into competence. The resulting model can be applied more generally to analyze incentives given by promotion inside the bureaucracy.

1.4.1   Set up

Consider a society in which there are two types of individuals, $t \in \{0, 1\}$, who we will call *left* ($t = 0$) and *right* ($t = 1$). The task of bureaucracy is to match a policy $x \in \{0, 1\}$ to a state of the world $m \in \{0, 1\}$. The prior of all actors concerning m is that both states occur with probability $\frac{1}{2}$. All

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[30] See for example Besley and Coate (1997), Caillaud and Tirole (2002) or Osborne and Slivinski (1996).

[31] For more examples see Colomer (2005), Lagunoff (2001) or summaries offered in Persson and Tabellini (2000).

individuals in society have the following utility from decision x

$$U(x, m, t) = I(x = m)\pi + I(x = t)\tau$$

where I is an indicator function that takes the value $I = 1$ if the condition inside the bracket is met and $I = 0$ otherwise. For example, a left individual ($t = 0$) receives $U = \pi + \tau$ if $x = m = 0$ but only $U = \pi$ if $x = m = 1$.

In this set-up all individuals receive the same benefit from matching policy to state, $x = m$. But there is a potential conflict between individuals of different types because $x = t$ can only be satisfied for one type at a time. The component τ therefore captures group-specific taste or group-specific economic characteristics that have an effect on the benefit from the policy. Another interpretation is that π captures the benefits from efficient public good provision while τ captures the redistribute elements of state policy. In any case, high values of τ relative to π imply that society is politically polarized.

We model the choices of four actors: a left incumbent, a right challenger and two candidates for the civil service, one of each type. Before the game starts, the incumbent decides on the bureaucratic system, $S \in \{merit, patr\}$. The choice of S governs the rules of bureaucratic recruitment discussed below. When choosing S, the incumbent maximizes the expected value of $U(x, m, t)$ plus a rent, R, gained by the politician in power.[32]

After the decision on S the candidates for the bureaucratic job invest in competence. They decide on their investment levels, $e \in \{e_l, e_h\}$ with $1 > e_h > e_l \geq 0$. If a candidate invests, her investment level is $e = e_h$ and

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[32] This rent represents pecuniary benefits (for example corruption) or non-pecuniary benefits (for example prestige) of public office.

she pays a cost $c > 0$. A candidate decides on her investment by maximizing the expected value of $U(x, m, t)$ minus the cost of investment.

The investment cost c plays an important role for the choice between meritocracy and patronage. We interpret this cost as the need to specialize in order to become effective for policy-making. Posts that require a lot of specialized knowledge then go hand in hand with higher costs.[33]

In their investment decision, candidates take into account whether the incumbent will stay in power or be replaced by his right competitor. The likelihood that the incumbent will stay in power is determined by a political contest between the two groups in which the more powerful group is more likely to prevail. We model this struggle for power as an election in which (a subset of) society decides whether to keep the left incumbent in office or replace him by the right challenger. Details are discussed below, for now we denote the resulting probability of re-election of the incumbent

$$p \equiv \Pr(\text{re-election} \mid S).$$

Bureaucratic recruitment takes place after the type of the politician is determined by the struggle for power. The rules for this recruitment are determined by the bureaucratic system S. If $S = merit$ a neutral commission decides who to recruit. The commission recruits the candidate with the highest investment and tosses a fair coin if both candidates have the same level of competence. If $S = patr$ the politician in power picks his bureaucrat under full knowledge of type and investment level.

After one of the candidates is recruited to become the bureaucrat, she

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[33]Note that costs include opportunity costs. This is particularly relevant when wages within the public sector are lower than in the private sector and competent public decision-making requires public sector experience.

observes the state of the world $m \in \{0, 1\}$ with probability e. She then picks policy $x \in \{0, 1\}$ to maximize $U(x, m, t)$.

Figure 2 visualizes the timing of events. It should be stressed that the bureaucratic system is a political state variable in this game. The incumbent chooses the method of recruitment for a future government and will therefore try to influence its choice of policy, x, indirectly.
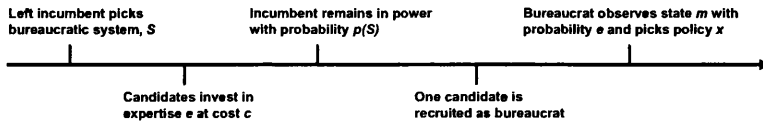
Figure 2: Game Structure

In what follows, we solve the game through backwards induction. The solution then builds the backbone for the next section in which we discuss under what parameter values the left incumbent introduces recruitment by merit and whether this choice maximizes welfare.

1.4.2 The Bureaucrat's Policy Choice

In the last stage, the bureaucrat observes the state m with probability e and decides on policy x. In her choice, she maximizes her expected utility

$$U(x, m, t) = I(x = m)\pi + I(x = t)\tau.$$

Remember that her prior is $m = 1$ with probability $\frac{1}{2}$. This immediately implies that when uninformed, she maximizes expected utility by matching x to her own type t.

In case she is informed, her decision depends crucially on the level of polarization in society. If $\tau < \pi$ the policy will be matched to the state of

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the world ($x = m$) even if this means giving up τ. If $\tau \geq \pi$, however, the bureaucrat always sets $x = t$. This means that information and competence loose their purpose if $\tau \geq \pi$. Given that investment is costly, this instantly implies that investment is always 0 in this case.

We will therefore focus on low levels of polarization ($\tau < \pi$) for now and discuss the much simpler case of high polarization ($\tau \geq \pi$) in the last section.

1.4.3 Recruitment

Recruitment under patronage follows the preferences of the politician in power. The expected value of the two different bureaucrat-politician matches are therefore important. Denote the expected political payoff an individual of type i receives from bureaucrat of type j by U_i^j.

The expected utility for the politician of type $t \in \{0, 1\}$ from a bureaucrat of his own type with investment e is

$$U_t^t = \frac{1}{2}(\pi + \tau) + \frac{1}{2}\left(e\pi + (1 - e)\tau\right).$$

To understand this formula, note first that the prior of the politician is that both the state $m = 0$ and $m = 1$ arise with probability $\frac{1}{2}$. If $m = t$ there is no case in which the bureaucrat misses $x = m$ because every time when uninformed she picks policy $x = t$. That explains the first term. If $m \neq t$, however, the policy can not match the state of the world and the type at the same time. Either the bureaucrat is informed and picks $x = m$ or she is uninformed and picks $x = t$. The level of investment therefore only matters in that state. Note that because $\pi > \tau$ expected utility is strictly increasing in e.

The politician expects the following utility from a match with an opposite type

$$U_t^{-t} = \frac{1}{2}\pi + \frac{1}{2}e(\pi + \tau).$$

Comparing this expected utility we see that at any given level of $e < 1$ the congruent bureaucrat provides a higher expected utility to the politician. To see this, note that

$$U_t^t - U_t^{-t} = (1 - e)\tau$$

which shows that the difference is driven by the fact that when uninformed, the bureaucrat's actions are be guided by the same group interest. For levels of competence close to 1 group membership loses its importance because state policy becomes increasingly objective. We believe that for all its simplicity, this mechanism could be important for the selection of bureaucrats. The less informed government is, the more ideological will be its policy-making and the more possibility for conflict between bureaucrat and politician.[34]

Under patronage, the politician chooses the bureaucrat, taking into account both the type and the investment e of the two candidates. One of the fascinating features of this way of recruiting personnel for the civil service is that types can work as a handicap. Under some circumstances this handicap is so important that candidates of the opposite type are not able to compete with candidates of the politician's type.

Lemma 1 *Recruitment under patronage ignores the investment if the loss caused by a mismatch in types is larger than the expected gain from more*

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[34] The advantage of modeling the effect through a group specific interest and not a prior is that the expectations of different actors with regard to policy benefits are consistent with each other.

competent policy making

$$\mathbf{A1} : (1 - e_h)\,\tau > \frac{1}{2}\,(e_h - e_l)\,(\pi - \tau)$$

If A1 is fulfilled, the politician always chooses a bureaucrat of his own type.

Proof. The politician selects his own type even if she has the disadvantage of a low investment if

$$\frac{1}{2}(\pi + \tau) + \frac{1}{2}\,(e_l\pi + (1 - e_l)\tau) > \frac{1}{2}\pi + \frac{1}{2}e_h(\pi + \tau)$$

Rewriting this condition leads to the condition in the lemma. ∎

The condition in lemma 1 is easier to satisfy if τ is relatively high and π is relatively low. Hence, patronage ignores investments if political preferences are relatively important in government decisions.

It is important to note at this point that $A1$ is crucial for some of our main results. If it does not hold, recruitment under patronage discriminates against non-matching types only in cases where investment by the two candidates is identical. We show below that meritocracy then looses part of its appeal for the incumbent. That said, note that $A1$ will always hold (for $\tau > 0$) if $e_h - e_l$ is small, i.e. there is always some degree of discrimination against non-matching types under patronage.

Under meritocracy the institution which recruits bureaucrats ignores their types. If one of the two candidates invested more, that person is chosen to become the bureaucrat. If both invested the same, each individual is chosen with a probability of $\frac{1}{2}$. Note that this commitment to recruit the most competent candidate prepares the ground for a very direct link between the investment decision and the probability of being recruited. Regardless

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of the investment decision of the other agent and the type of politician in power, high instead of low investment always increases the probability of becoming the bureaucrat by $\frac{1}{2}$.

1.4.4 Political Competition

Competition for the political office is modelled as an election by a subset of the population. In order to model the distribution of political power we assume that this subset can be biased. In particular, we assume that a share λ of the electorate is left ($t = 0$) and a share $1 - \lambda$ is right ($t = 1$). Hence, a left monopoly over political power is described by $\lambda = 1$ while a more equal distribution of power leads to $\lambda < 1$.

We assume that a share $1 - \alpha$ of the electorate always votes according to their type. A share α only cares about the decision x and votes if this improves their expected utility $U(x, m, t)$. This makes the decision of the share α of votes endogenous to the bureaucratic system S.

If $S = patr$, politicians control recruitment in period 1 and, hence, their type affects the expected value of $U(x, m, t)$. It is then a dominant strategy for a voter of type t to vote for his type of politician because this implies a perfect match of interests.[35] The left incumbent then wins the struggle for power if

$$\alpha \lambda + (1 - \alpha)\lambda + \varepsilon > \alpha (1 - \lambda) + (1 - \alpha)(1 - \lambda)$$

where $\varepsilon \in [-1, 1]$ is an uniformly distributed shock to the number of left

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[35] The set-up here is related to the citizen-candidate models of political competition. However, the model always has two candidates. This excludes any incentive to vote strategically if voting is costless.

votes. Re-writing this condition yields

$$\varepsilon > 1 - 2\lambda$$

and the probability of re-election is

$$p_{patr} = \lambda.$$

If $S = merit$ on the other hand, recruitment is not in the hands of the politician and the voters who care only about x are indifferent between the left and right politician. Given that individuals who care about x abstain or randomize, the left incumbent wins if

$$(1 - \alpha)\lambda + \varepsilon > (1 - \alpha)(1 - \lambda)$$

and probability of re-election becomes

$$p_{merit} = \frac{1 - (1 - 2\lambda)(1 - \alpha)}{2}.$$

A comparison of these two probabilities yields the following result.

Lemma 2 *Assume $\alpha > 0$. Given that the incumbent's group is powerful $\left(\lambda > \frac{1}{2}\right)$ patronage leads to a higher probability of re-election than meritocracy. The opposite is true for $\lambda < \frac{1}{2}$.*

Proof. Note that

$$\begin{aligned} p_{patr} - p_{merit} &= \lambda - \frac{1 - (1 - 2\lambda)(1 - \alpha)}{2} \\ &= \alpha\left(\lambda - \frac{1}{2}\right) \end{aligned}$$

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the lemma follows immediately. ∎

Lemma 2 describes the fact that patronage as a bureaucratic system can lead to a more radical political climate. A switch from meritocratic recruitment to political recruitment increases the stakes connected to political leadership. Exactly by how much is determined by the parameter α.

A fascinating corollary from lemma 2 is that strong political resistance $(\lambda < \frac{1}{2})$ can be partly defused by moving decisions into the realm of meritocratic recruitment.

1.4.5 Investment

We first analyze investment under patronage. Given $A1$, the left candidate will become bureaucrat if and only if there is a left politician heading the executive. This makes the investment decision of the candidates highly dependant on $p_{patr} = \lambda$.

Lemma 3 *Under patronage the left candidate invests if*

$$\lambda \frac{1}{2} \left(e_h - e_l \right) \left(\pi - \tau \right) > c$$

and the right candidate invests if

$$(1 - \lambda) \frac{1}{2} \left(e_h - e_l \right) \left(\pi - \tau \right) > c$$

Expected competence is maximized at a power monopoly $(\lambda \in \{0, 1\})$.

Proof. Note that there is no strategic interaction between the two candidates under $A1$. The left candidate invests if

$$\lambda \left[\frac{1}{2}(\pi + \tau) + \frac{1}{2}\left(e_h\pi + (1 - e_h)\tau\right)\right] + (1 - \lambda)\left[\frac{1}{2}\pi + \frac{1}{2}e(\pi + \tau)\right] - c$$
$$> \lambda \left[\frac{1}{2}(\pi + \tau) + \frac{1}{2}\left(e_l\pi + (1 - e_l)\tau\right)\right] + (1 - \lambda)\left[\frac{1}{2}\pi + \frac{1}{2}e(\pi + \tau)\right]$$

where e denotes the investment of the right candidate. This condition can be rewritten to

$$\lambda\frac{1}{2}\left(e_h - e_l\right)(\pi - \tau) > c$$

The argument for the right candidate is analogous. Given these investment decisions and $A1$ it follows that overall expected competence is maximized if we have either a left or a right power monopoly, $\lambda \in \{0, 1\}$, as this leads to certain recruitment of a candidate with competence $e = e_h$ for all $c < \frac{1}{2}\left(e_h - e_l\right)(\pi - \tau)$. ∎

Patronage under $A1$ creates a labor market monopsony for candidates of the politician's type. This kills competition for the post between types. What remains as an investment incentive is the internalized, expected gain from improved competence in decision-making. The left candidate for example knows she will be recruited with probability λ. Her expected gain in decision-making if she invests is $\frac{1}{2}\left(e_h - e_l\right)(\pi - \tau)$. The parameter τ enters negatively in this term because more information leads to less type motivated decisions.

Competence is maximized under a power monopoly ($\lambda \in \{0, 1\}$) because the more competent candidate is hired with certainty in that situation. In a left power monopoly ($\lambda = 0$) for example, the right candidate never invests while the propensity to invest is maximized for the left candidate. At the

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same time, the power monopoly ensures that a left politician is in power in the future which ensures that the left candidate is always hired.

Recruitment under *meritocracy* is independent of who is in power and, hence, the investment decision is symmetric between the two candidates. It can be summarized in a single investment probability, z.

Lemma 4 *Denote the probability that a candidate invests under meritocracy by $z \in [0, 1]$. Meritocracy leads to full investment, $z = 1$, if $c \leq \frac{1}{2}(1 - e_h)\tau$ and*

$$z = \max \left\{ 1 - \frac{c - \frac{1}{2}(1 - e_h)\tau}{\frac{1}{2}(e_h - e_l)\pi}, 0 \right\}$$

otherwise.

Proof. See the appendix A.1. ∎

Note that now the group-specific component τ affects the level of competence positively. By investing, the candidate increases her probability of being hired and reduces the probability of the other type being hired - the two candidates compete for influence through their competence. Political polarization therefore has a positive effect on investment.

The comparison of expected competence under patronage and meritocracy is complicated by the fact that investment depends on the distribution of power, λ, under patronage but not under meritocracy. It is important to note, however, that meritocracy fares relatively well for high levels of investment costs. Investment does not drop to zero unless $c > \frac{1}{2}(1 - e_h)\tau + \frac{1}{2}(e_h - e_l)\pi$. Under patronage it does already at $c = \frac{1}{2}(e_h - e_l)(\pi - \tau)$ which is strictly smaller. Hence, meritocracy has a clear competence advantage if competence is costly.

1.5 Results

In this section we discuss under what conditions government introduces meritocracy and why this choice is connected to political power. We then turn towards the welfare implications of our findings and show that they might contribute to a better understanding of the welfare effects of bureaucratic systems and the distribution political power.

1.5.1 The Role of Political Power

Before we discuss our main results it will be useful to point out a main driving force behind the switch from patronage to meritocracy with falling political power λ.

Lemma 5 *Political power, λ, ceteris paribus increases the expected value of $U(x, m, t)$ for the incumbent under patronage. The expected utility from x is not affected by λ under meritocracy.*

Proof. For a proof of the change under patronage see appendix A.2. We showed in the previous section that neither recruitment nor investment depend on p_{merit} and, hence, λ under meritocracy. The second part of the lemma follows immediately. ∎

Lemma 5 confirms that patronage makes the incumbent's expected utility dependant on the distribution of political power while meritocracy does not.[36] This is not surprising given the explicit aim of meritocracy to depoliticize recruitment. But the simplicity of lemma 5 relies on the fact that the investment decisions described in lemma 3 is ignored. A comparison of

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[36] This qualitative statement is not changed with the inclusion of the expected rent for the left incumbent $p \cdot R$. Given lemma 2, the re-election probability p is affected more by political power λ under patronage than under meritocracy. This implies that loss of power affects the expected rent more under patronage than under meritocracy.

meritocracy and patronage, however, has to include both the direct effect of political recruitment control on $U(x, m, t)$ and the indirect effect through investments. We therefore need to combine lemmas 3, 4 and 5. A visualization is offered in figures 3 and 4.
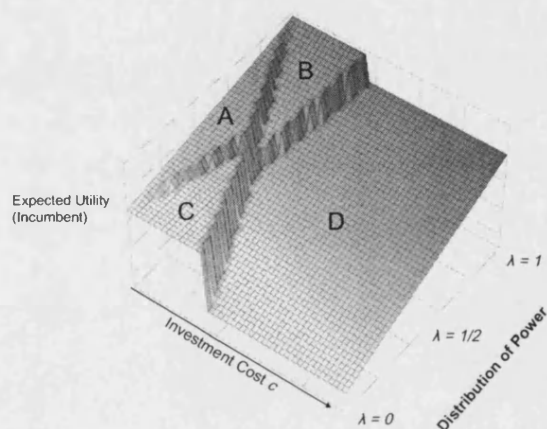
Figure 3: Incumbent's Expected Utility from Patronage

Figure 3 depicts the expected value of $U(x, m, t)$ under patronage for the left incumbent. The four areas A to D are determined by the two investment lines given in lemma 3. In area A, both candidates invest. The triangular shape of that area is created by the fact that under a relatively equal distribution of power ($\lambda = \frac{1}{2}$) both candidates have the same incentive to invest into competence. It is therefore always the case the both candidates stop investing at the same level of investment cost c. The point at which both stop investing is clearly visible because the incumbent's expected utility drops drastically at that point. In areas B and C only one of the candidates invests. Area B, for example describes a situation with high levels of left power, λ, in which only the left candidate invests because the likelihood that

she is hired is sufficiently high. The right candidate never invests for high λ because her group has little access to political power and so she is rarely hired.

The first part of lemma 5 is a description of the slope in each of the areas A to D with respect to λ. For a given level of competence, the incumbent benefits from a higher likelihood of a left bureaucrat. Under patronage this likelihood is exactly λ.
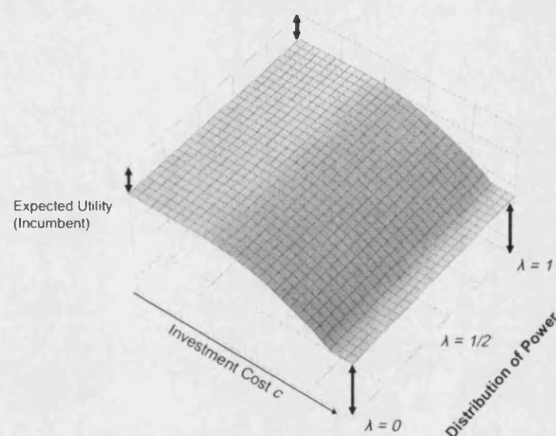
Figure 4: Incumbent's Expected Utility from Meritocracy

Figure 4 visualizes the incumbent's expected value of $U(x, m, t)$ under meritocracy. As described in lemma 5, the expected value of $U(x, m, t)$ is independent of λ in this case. Figure 4 reflects this de-politicisation through

Combining the insights in lemma 1 to 5 allows us to put down our first central result.

Proposition 1 *Given A1, the departure from a power monopoly ($\lambda = 1$) makes meritocracy (weakly) more attractive for the incumbent.*

Proof. The proposition follows immediately from lemmas 2 to 5. By lemma 5 meritocracy always gains relatively from a decrease in λ if competence does not change. By lemma 3 competence under patronage is maximized at $\lambda = 1$ and by lemma 4 competence under meritocracy is independent of λ. Given a departure from $\lambda = 1$, the expected value of $U(x, m, t)$ is therefore weakly decreasing under patronage but constant under meritocracy. In addition, lemma 2 showed that the expected rent R is more heavily affected by λ under patronage. The proposition follows from combining these three factors. ∎

Proposition 1 is a qualitative statement about disruptions in power monopolies. It states that governments will have more incentives to abandon patronage if they cease to have a monopoly on power. The reasons are threefold.

First, losing power under patronage always means loosing control over recruitment. Moving away from a left power monopoly ($\lambda = 1$) therefore implies a higher likelihood that the right candidate is hired. The pure effect of control loss over recruitment can be best seen in area D. Any departure from a power monopoly always leads to a decrease in utility. Under meritocracy on the other hand, recruitment is allocated to the neutral commission and is therefore independent of λ.

Secondly, competence suffers from a departure of $\lambda = 1$ under patronage but not under meritocracy. To see this note that by lemma 3 the right candidate never invests under patronage if $\lambda = 1$ because she is never hired.

If λ decreases slightly, her investment decision does not change but she is hired with positive probability. The overall effect on expected utility can be seen in figure 3. Areas A and B converge for high λ and lead to the same expected utility at $\lambda = 1$ in the upper left corner. Under meritocracy, competence is independent of λ and, hence, does not fall when λ falls.

Thirdly, the scope for boosting the election likelihood with patronage decreases as political power decreases. While the introduction of meritocratic recruitment leads to a considerable loss of election likelihood in a power monopoly, this loss diminishes with falling power. This also diminishes the incentives of the incumbent to stick to patronage for the sake of an increased expected ego-rent and meritocracy becomes relatively more attractive.

Proposition 1 leaves the question whether the left incumbent ever prefers to introduce meritocracy. The following proposition answers this question.

Proposition 2 *Assume A1. For an equal distribution of political power* $(\lambda = \frac{1}{2})$ *meritocracy weakly dominates. In addition, there is always an interval of investment costs c at which the incumbent introduces the merit system even when his group is powerful (i.e. for some $\lambda > \frac{1}{2}$).*

Proof. See appendix A.3 for a proof and exact upper and lower bounds on c. ■

Why is meritocracy dominant if political power is equally distributed? The three channels described above create the weak dominance. If political power is equally distributed, patronage does not offer a boost in the election likelihood at this level because it creates resistance and support to exactly equal amounts. Patronage therefore implies exactly the same likelihood of re-election as meritocracy. This implies that both the expected ego-rent and the amount of political control over recruitment are identical under

both systems. This shifts the focus to competence.

Meritocracy dominates because it offers a weakly higher competence than patronage when power is shared ($\lambda = \frac{1}{2}$). The underlying reason for this dominance is that from point of view of the candidates, the recruitment bias is exogenous under patronage. Candidates therefore do not increase their group specific rent, $(1 - e)\tau$, by investing. Under meritocracy candidates know that if they do not invest, the other type will be chosen more likely. Meritocracy manages to motivate investment by channeling political conflict into the bureaucracy.

It is important to note that strict dominance of meritocracy at $\lambda = \frac{1}{2}$ implies that there are values of $\lambda > \frac{1}{2}$ at which the left incumbent prefers the isolation of bureaucracy from politics. Intuitively this is because he is willing to exchange some informal power of like-minded bureaucrats for more competence. While the introduction of the merit system lowers the probability of a left bureaucrat from p to $\frac{1}{2}$ it raises competence by giving the candidates an incentive to invest.

Figure 5 merges figures 3 and 4 and shows that meritocracy weakly dominates for $\lambda = \frac{1}{2}$.[37] As can be seen in the graph, the competence advantage can be so important that meritocracy is preferred even under a left power monopoly. In all other cases a change from power monopoly to perfect political competition will lead to a switch from patronage to meritocracy.

A corollary of proposition 2 is that changes in investment costs, c, can create consensus in the introduction of the merit system. If investment costs are low, powerful groups are likely to oppose the introduction of meritoc-

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[37]Note that figure 5 ignores the expected ego-rent. If it is included, the incumbent is less inclined to switch to meritocracy if he is powerful. The difference of expected utility between the two system at $\lambda = \frac{1}{2}$ remains unaltered, however, which implies that there will still be some c at which the incumbent prefers meritocracy even when he is powerful.

racy because it implies a loss in control. A movement from low values of c to intermediate values can resolve this problem by making meritocracy universally beneficial. If high costs reflect a high degree of specialization in policy matters, complex modern states are more likely to cause high costs. Consensus in the introduction of the merit system is then more likely in these states as the benefits from meritocracy are higher.
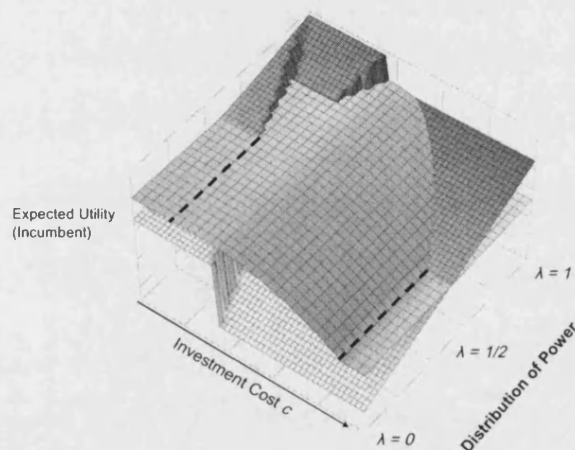
Figure 5: Dominance of Meritocracy under Shared Power

This also suggests an interesting comparative static with respect to τ. As mentioned above, $\tau > \pi$ implies that bureaucrats ignore their information and follow their types. In that situation, competence does not matter and meritocracy will only be chosen if $\lambda \leq \frac{1}{2}$.[38] If we interpret τ as the level of polarization this indicates that if society is very polarized meritocracy can never be introduced in consensus.

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[38] This is also why proposition 1 and 2 do not need $A0$.

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What happens as society becomes less polarized? The most important impact of a decreasing τ is that it diminishes the incentive of the politician to ignore investments under patronage. For low values of τ, $A1$ can be violated and the politician recruits his own type only if both candidates are equally competent. We show in appendix A.4 that the choice between meritocracy and patronage is still affected by the expected control over recruitment. However, meritocracy looses its clear advantage in creating competence and, hence, cedes to dominate for $\lambda = \frac{1}{2}$. As τ goes to 0 the two recruitment systems are identical.

1.5.2 Bureaucratic Systems and Welfare

Up to now we have focused on providing an explanation of the choices made by a government. But the framework also allows for an evaluation of this choice. As a benchmark, we first describe the maximum utilitarian welfare.

Assume that the number of individuals affected by decision x is P. For simplicity, we assume that exactly half of the individuals in society are left ($t = 0$) so that regardless of the decision x there is always a type-specific welfare of $\frac{1}{2}P\tau$. Utilitarian welfare is then maximized if $x = m$ given that m is known. This holds regardless of the relative size of π and τ.

Given that investment is costly, it is always optimal that only one candidate invests and becomes bureaucrat. Investment of that candidate should be high if

$$(e_h - e_l) P\pi \geq c$$

and low otherwise. Hence, first-best investment is high if common interests are important (high π), many people are affected by the decision (high P) and if investment improves decision-making sufficiently (high $e_h - e_l$). As-

sume that $P \to \infty$ so that the bureaucratic system that maximizes expected competence is welfare maximizing - regardless of the investment costs it is causing. Our analysis of investment then yields the following result.

Proposition 3 *Assume A0, A1 and $P \to \infty$. Meritocracy yields a (weakly) higher welfare for high and low investment costs and $\lambda \neq 0, 1$. However, patronage strictly dominates for a combination of high concentrations of power and intermediate investment costs*

$$(e_h - e_l) (\pi - \tau) \geq c > (1 - e_h) \tau$$

Proof. See appendix A.5. ∎

The first part of proposition 3 could be regarded as the reason why meritocratic recruitment is often seen as a factor in good governance - in most situations, meritocracy is welfare dominating patronage.[39] Perhaps the more intriguing finding in proposition 3 is that patronage can be more efficient than meritocracy if power is sufficiently concentrated. If the gains from better policy-making are important, candidates under patronage invest with certainty at low levels of c. This can even imply competence in situations where the likelihood of investment is less than one under meritocracy.

This finding stands in contrast to the common notion that patronage implies bureaucratic inefficiency. As the proposition shows, this assumption is only in place when power is shared in society.

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[39] A large population, $P \to \infty$, is important for generalizing this statement because meritocracy leads to a relatively large amount of waste in investments. These can only be justified if the population affected by the decision is large.

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1.5.3 Political Power and Welfare

While the scope of this article is naturally limited through the focus on bureaucratic decisions, the framework allows for some interesting insights on the effects of power on welfare. We maintain the assumption that the population affected by the bureaucratic decision is large.

Proposition 4 *A monopoly of power for the incumbent is welfare maximizing as long as his preferred candidate invests into competence, i.e. if $c \leq \frac{1}{2}(e_h - e_l)(\pi - \tau)$. It (weakly) harms welfare for all $c > \frac{1}{2}(e_h - e_l)(\pi - \tau)$ such that*

$$\left[1 - (1 - z)^2\right](e_h - e_l)\pi < (1 - e_l)\tau + \frac{1}{2}\alpha R$$

because the incumbent does not introduce meritocracy despite incompetence in government.

Proof. The proof is presented in appendix A.6. ∎

Proposition 4 describes a link between political power, bureaucratic systems and welfare outcomes. According to the proposition, high concentrations of power can be good for welfare if bureaucratic competence is relatively cheap and can be reached within patronage. As bureaucrats have to invest more to become effective, however, a power monopoly can fail to make the switch to meritocracy. The condition in the proposition shows that this is the case for high values of $\frac{1}{2}\alpha R$ and low values of π.

The term $\frac{1}{2}\alpha R$ measures the personal political benefits of the politician from patronage. If the share of voters motivated through decision x is large (large α) the incumbent will face a considerable loss in the likelihood of being elected when he switches to meritocracy. If the personal rents from power, R, are high this loss of re-election probability can be an important

reason to keep patronage in place, despite the costs of incompetence.

Common interest, π, on the other hand always improves the performance of power monopolies because it leads to less aversion to meritocracy. The reason is that with more benefits from matching policy to the state of the world, the incumbent is more inclined to trade improved competence for the loss of control over recruitment.

The role of polarization, τ, in proposition 4 is ambiguous. On the one hand it prevents the incumbent to switch to meritocracy because it implies less control over who is recruited. On the other hand it improves investment under meritocracy and, hence, makes it more attractive for the incumbent. The real-world implication is that conflict harms welfare if and only if it prevents a switch to meritocratic recruitment.

A visualization of the condition in proposition 4 (for $R = 0$) is provided by the upper brim, $\lambda = 1$, of figure 5. For low levels of c, patronage leads to high levels of competence and dominates meritocracy clearly - the choice of the incumbent is in line with welfare maximization. As investment costs increase, competence under patronage drops to zero and the incumbent is willing to switch to meritocracy because he values its competence advantage sufficiently. This advantage shrinks, however, as investment costs increase further and patronage is again chosen despite the fact that it leads to welfare losses. The condition in proposition 4 is then satisfied.

Finally, the framework allows us to analyze the welfare effects caused by departures from a power monopoly. Such an analysis is important as it could capture some elements of the complex effects of political liberalization.

Proposition 5 *Transition from a power monopoly, $\lambda \in \{0, 1\}$, to an equal distribution of power, $\lambda = \frac{1}{2}$, leads to a slight decrease of welfare for low*

investment costs and an increase for high investment costs. A partial sharing of power, $\lambda \in \left(\frac{1}{2}, 1\right)$, can only improve welfare if it leads to an abandonment of patronage.

Proof. The first part of the proposition follows from propositions 2 and 4. According to proposition 2 the incumbent weakly prefers meritocracy for $\lambda = \frac{1}{2}$. Assuming that he introduces it, we know that investment costs increase compared to the situation where only the left candidate invests and is recruited. This implies a slight welfare loss as competence remains the same. For investment costs $c > \frac{1}{2}(e_h - e_l)(\pi - \tau)$ the incumbent either introduces meritocracy at $\lambda = 1$ or sticks to patronage. If he sticks to patronage at $\lambda = 1$, the change to $\lambda = \frac{1}{2}$ and, hence, meritocracy is (weakly) welfare increasing. The second part of the proposition follows from the fact that values of $\lambda \in \left(\frac{1}{2}, 1\right)$ do not always lead to a change to meritocracy but weakly reduce welfare from patronage. $\blacksquare$

The last part of proposition 5 can be understood as a warning about partial political reform. If changes in the political system take place to the background of high personal rents (αR), for example, they can be detrimental to welfare because they harm the performance of patronage but do not imply a switch to meritocracy.

1.6 Discussion

The reasons for the change from patronage to merit system are numerous. In an attempt to explain the choice, this paper conceptualizes these two systems as different ways of recruiting and promoting bureaucrats. One of the important advantages of patronage in this context is that it guarantees politically homogenous governments in situations where political loyalty is

important. Meritocratic recruitment and promotion can be interpreted as a commitment to ignore loyalty considerations. We have shown that this commitment can improve competence compared to patronage by channeling political competition into the bureaucracy.

The main aim of our theoretical framework is to provide insights into how the distribution of political power affects the choice between meritocracy and patronage. We have shown that the decline of political power will typically increase the attractiveness of meritocracy. This holds despite the fact that a share of the population is more motivated to support the government under patronage. The reason is that governments can only increase their support through patronage as long as they control recruitment in the future. If the two groups competing for the seat in government are equally powerful, patronage only increases the stakes without giving one group and advantage over the other.

A surprising corollary from this finding is that political liberalization and meritocracy can be substitutes - weak governments can decrease political pressure for political change by introducing meritocracy. This factor could be important. One historic example that could be explained along these lines is that the Prussian government resisted strong pressures for political liberalization in the 19th century while at the same time introducing rules of recruitment and promotion that improved the access to power for the rising bourgeoisie.[40]

But the fact that meritocracy lowers the stake of political competition could also have implications in a very different setting. We would expect less motivated participation in political struggles if more decisions are allo-

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[40] One sign of this access is that young men were able to marry noble women once they rose inside the state bureaucracy. For a more detailed discussion see Haas (2004).

cated to meritocratically recruited personnel. Low voter participation, for example, could then be interpreted as a side-effect of the increased use of expert opinions in policy-making.

We identify the cost of competence as a key determinant of the choice between meritocracy and patronage. If costs are sufficiently low, patronage is favored by a powerful government and consensus on abolition is impossible. An increase in costs in our model could be interpreted as an increased need to acquire specialized knowledge for policy-making. As the need for expert knowledge increases, meritocracy becomes more attractive.

This could explain two sorts of variation. First, it might explain why some government bodies recruit by merit while others recruit by patronage. Central banks or the military, for example, might recruit by merit because officials in these areas have to acquire a relatively specific expertise to become effective. Secondly, the link between high costs and meritocracy can explain why the civil service often coincides with modern centralized states. The early adoption of relatively meritocratic promotion and use state examinations in China and Prussia, for example, could be explained along these lines.

It should be stressed that despite being highly simplified, our framework is able to capture the gist of a much richer model in which bureaucrats choose from a large variety of policy choices and can specialize either in being well-informed about the policy that maximizes group-specific rents or in being well-informed about the policy that maximizes overall economic growth. That kind of model would yield similar results as long as information on the growth maximizing policy is harder to acquire than information on rent maximization. Recent empirical work by Iyer and Mani (2007) on senior civil servants in India lends some support to the impression that actual choices

of bureaucrats reflect this specialization in expertise or loyalty.[41]

Throughout this article, we have modelled bureaucratic systems as political state variables that cannot be altered easily. While this is likely realistic for a switch from patronage to meritocracy, it is less obvious why politicians will not recruit loyal types despite the existence of meritocratic institutions like a civil service commission and state exams. There are two reasons. First, meritocratic institutions typically increase transparency of the recruiting process and independent commissions will resist a decline of their power. Secondly, the increase in competence linked to meritocracy creates a larger ex ante consensus between different groups in society to maintain the institutions. While this consensus is not important in the one period model presented here, it can be of crucial importance for maintaining cooperation in a dynamic game.

Our analysis of the welfare effects, links this paper to the broader literature on the role of institutions in promoting growth. We have shown that meritocratic systems are, generally speaking, *good* institutions. However, a government's choice of bureaucratic structure will be biased if common interests in society are weak and the private benefits from maintaining patronage are important. An additional implication of our analysis is that these mechanisms work through the extent to which the government decision is biased against meritocratic recruitment. This distinction is particularly interesting for polarization as our findings imply that it will be associated with good outcomes if meritocratic recruitment can be maintained but with bad outcomes if patronage prevails.

Within its theoretical restrictions, this article also aims to contribute to

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[41] Their empiricical analysis of career paths reveals that political change indeed affects bureaucrats less when they are specialized in expertize.

the broader discussion of the role of political institutions in creating good governance.[42] Effective governance in the basic framework presented here can be reached in two ways. For low costs of specialization, competent governance can be achieved by a combination of power monopoly and patronage. A diffusion of political power can only harm competence in this setting. If bureaucratic decision-making requires a more specialized knowledge, however, government competence will typically only be reached if power is perfectly shared. The underlying reasons for the failure of power monopolies in this setting is that group-specific interests and high personal rents in government prevent bureaucratic reforms that would improve competence.

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[42]See for example Besley and Kudamatsu (2007), Rodrik and Wacziarg (2005), and Przeworski and Limongi (1993) for a summary of earlier literature.

Table 1: The History of State Exams in Selected Western European Countries

United Kingdom	1832	first reform act - middle classes gained the right to vote
	1853	Northcote-Trevelyan report - explicitly states that volatility of ministers is a problem for government, the document states the need for a permanent bureaucracy to guarantee competence
	1855	Civil Service Commission is created
	1867	second reform act - working class men gained the right to vote
	1870	Britain introduces open competitive entry exams
Spain	1868	first revolution, soon followed by the declaration of a first republic
	1875-1917	Spain remains divided and governments rotate quickly, arguments emerge that the spoils system places job security at risk in this context, instability prevents major reforms
	1918	Estatuto de Funcionarios introduces state examinations and job security for civil servants
	1923-1975	despite the legislation, recruiting rules are reversed, particularly under the Franco regime 1938-1975
Belgium	1918	Declaration of universal suffrage by the King, first election ends catholic dominance of Belgian politics
	1937	Camu statute introduces state examination and promotion based on merit for higher grades
France	1789	French Revolution, development of a principal of equal access to civil service positions
	1799	Napoleon crowned first consul
	1850+	selective introduction of competitive entry procedures
	1871	third Republic, end of monarchy in France
	1871+	generalisation of state examinations

Sources: Hondeghem (2000) for Belgium, Meininger (2000) for France and Parrado-Diez (2000) for Spain. Britain see previous section 2.1.

Table 2: Recruitment through State Exams and Political Competitiveness

	Use of State Exams	Use of State Exams	Use of State Exams	Use of State Exams
Political Competition	0.55***(3.02)	-	-	0.47**(2.34)
Selection	-	-1.08***(-3.32)	-	-
Election	-	-	0.83**(2.25)	-
Legal Origin UK	-	-	-	0.3(0.64)
Ethnic Fragmentation	-	-	-	0.94(1.37)
GDP per capita	-	-	-	0.01(1.0)
n	28	28	28	28
adj. R-squared	0.23	0.27	0.13	0.29

Use of State Exams measures the share of senior bureaucrats recruited through state exams. Political Competition measures competitive entry into the executive for politicians. Standard OLS regressions. t-statistics in paranthesis, * Significant at 10%, ** Significant at 5%, *** Significant at 1%

Sources: Use of State Exams from Rauch and Evans; Political Competition, Selection and Election from PolityIV; GDP per capita (in thousand US $) from Wolrd Economic Outlook 2007; Legal Origin UK from LaPorta et al (1999); Ethnic Fragmentation from Easterly and Levine (1997).

2 Not-for-profits and Incentives for Motivated Agents

(Joint with Maitreesh Ghatak)

2.1 Introduction

Not-for-profit organizations are an important part of most economies. In the United States, for example, there were about 1.4 million nonprofit organizations registered in 2006[43] and the sector contributed about 5.2 percent of GDP in 2004.[44] A defining characteristic of not-for-profit firms is that they are private but explicitly meant to further broad public interest. Attracted by this goal, considerable amounts of volunteering work is provided in not-for-profit organizations - about half of the 14 million full-time employees in the US not-for-profit sector work on voluntary basis.

The key feature that distinguishes not-for-profit firms from for-profits is the fact that those who exercise control in a not-for-profit are not allowed to capture the financial return of production. Why is an organizational form chosen that diminishes financial incentives? There are several answers that focus on what Hansmann (1980) calls *contractual failure*.[45] A particular mechanism that links the existence of not-for-profits, their focus on mission oriented activities, and their ability to attract voluntary labour contributions is Francois (2000). Francois shows that the financial motivation for the manager in the for-profit can crowd-out output related intrinsic motivation of the worker. The reduction of financial incentives in a not-for-profit can

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[43] Internal Revenue Service Data Book 2006, these include public charities, private foundations, and religious congregations.

[44] Thomas Pollack and Amy Blackwood, "The Nonprofit Sector in Brief: Facts and Figures from the Nonprofit Almanac 2007"

[45] See for example Easly and O'Hara (1983), Glaeser and Shleifer (2001) or Francois (2003).

then motivate the worker and allows for a reduction of wage payments.

In this article we present a simple model of moral hazard that captures this basic idea. The owner of a firm hires a worker who benefits intrinsically from the provision of a particular output (health, poverty reduction, etc.) but receives this non-pecuniary benefit regardless of his own efforts. This implies that the intrinsic motivation of the worker can only be translated into lower wages if the worker is *left alone* in the process. Put differently, if the worker has the feeling that output would be provided regardless of his efforts, he has to be paid a higher financial incentive to exert effort. If the owner of the firm can commit not to interfere with production, the workers knows output will fully reflect his actions and he is easier to motivate.

Our main goal is to endogenize organizational choice in this context. In particular, we analyze the motives of an individual controlling the organization (the manager)[46] and an individual hired in the labor market to work in the organization (the worker). An analysis of the worker and manager matching and endogenous organizational choice is important for empirical research as it might help our understanding of worker characteristics and wages in the for- and not-for-profit sector.[47]

First, we show that not-for-profits are only created because they are able to induce manager commitment and therefore worker effort at low wage costs. In our model, this implies that not-for-profit firms provide a low level of overall effort at low wage costs while for-profit firms provide high effort at high wage costs. As soon as the manager benefits sufficiently from project success, either for financial or for intrinsic reasons, he is willing to trade

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[46] One can show that in Francois (2000) the manager himself is worse off under government ownership.

[47] See, for example, Leete (2001) or Mocan and Tekin (2003) for a discussion.

higher wage costs for higher levels of effort. The not-for-profit is therefore chosen in sectors that offer low profit margins and by managers who are intrinsically not very motivated.

The last finding stands in contrast to the usual intuition that more intrinsically motivated managers will create not-for-profit firms. But in the case of this model[48] the contractual failure, unobservable worker effort, is not affecting the relationship between consumer/patron and manager but between worker and manager. Therefore, the not-for-profit firm is the solution to a conflict between manager and worker and not society and manager. This implies that the not-for-profit organizational form is chosen for different reasons than usually assumed.

This conceptual point is further reinforced by looking at worker self-selection. We show that if workers can choose freely whether they want to work in a for-profit or a not-for-profit firm they will always choose a for-profit. The reason is that workers earn lower wages and receive lower expected intrinsic benefits (since the manager does not supply effort) in the not-for-profit. To attract workers, not-for-profits would have to pay a higher wage and thereby loose their attractiveness as an organizational form for the manager. We show that with endogenous matching, not-for-profits do not arise if motivated workers are relatively scarce. Or, put differently, oversupply of intrinsically motivated labor is a necessary condition for the survival of not-for-profit firms.

Hence, the model suggests a rather pessimistic view on the link between not-for-profits and intrinsic motivation. Not-for-profits arise, not because motivated workers like to work in that organizational environment but because there is a surplus of motivated labor in these sectors. While the

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[48] And similarly in the well-cited model presented in Francois (2000).

for-profit is the institutional set-up that achieves the first best, it is not chosen by unmotivated managers who have market power. Our model suggests that if the management side was really motivated to *change the world* they would create for-profits. While this might not be realistic in general, it provides a theory for *social entrepreneurship* or the fourth sector[49] in areas in which contractual failure is not affecting the relationship between consumer and producer.

The plan of the paper is as follows. In the following section we discuss related literature. Section 2.3 presents the basic framework of our model. It captures the mechanism provided by Francois (2000) but proposes a standard contracting framework where incentive pay is possible. In section 2.4, we discuss the incentives of the manager to select the not-for-profit firm. Section 2.5 presents the incentives of the worker and briefly discusses optimal organizational choice under endogenous matching. Section 2.6 concludes.

2.2   Related Literature

At the very core of economics lies the notion that financial incentives are a powerful motor in the creation of economic welfare. This insight goes back to Adam Smith who wrote with regard to entrepreneurs:

It is the stock [capital] that is employed for the sake of profit, which puts into motion the greater part of the useful labour of every society. The plans and projects of the employers of stock regulate and direct all the most important operations of labour, and profit is the end proposed by all those plans and projects.[50]

But as pointed out by Hansmann (1980), it is exactly this motive that

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[49]See Bornstein (2004).

[50]Smith (2001), p. 347.

is restricted in the not-for-profit sector. An institutional nondistribution constraint restricts the financial benefit to those controlling the firm because it does not allow net earning to be dispersed amongst the owners. Clearly the economic importance of the not-for-profit stands in a conflict to the general belief of the usefulness of the profit motive as expressed by Smith. It is this fundamental contradiction that is at the core of a large part of the literature on not-for-profits.

Hansmann argued that an understanding of not-for-profits must come from the assumptions made in the classic economic framework. If these are not satisfied, not-for-profits can be welfare enhancing. In particular, he stresses the inability of consumers or patrons to police producers by ordinary contractual devices, which he calls *contract failure.*

An early formal model of contract failure as a motivation for not-for-profits is provided by Easly and O'Hara (1983). They model a society that is interested in maximizing welfare. The basic conflict in their framework is between the manager of a firm and consumers of firm output. They show that when output cannot be observed by society then managers have the incentive to raise their own utility and delivering less to the consumers. The nondistribution constraint works as a simple constraint to this behavior and can therefore increase welfare. Their model does not deal with self-selection of managers into organizational forms. The only constraint society has to take into account when offering the manager a *contract* is his participation constraint.

This conceptual problem is avoided in a more recent contribution of Edward Glaeser and Andrei Shleifer. They model the incentives of a manager who chooses between a for- and not-for-profit setting. Their analysis relies on the contractual problems in a multi-tasking environment pointed out

by Holmstrom and Milgrom (1991). Motivating an agent on a contractible task (effort in providing output) might lead to undesirable outcomes because another non-contractible task (effort in quality) is neglected. Glaeser and Shleifer (2001) apply this idea to argue that profit incentives might lead to undesirable outcomes from the point of view of donors who value the non-contractible outcome of the firm. It is then possible that not-for-profits attract donations because their *soft incentive* protects donor's interests. It can be shown in this context that not-for-profits remain attractive for managers because the reduced financial incentive in the not-for-profit is compensated by the increase in donations.

Francois (2000) develops a similar idea linked to the intrinsic motivation of workers. He shows that when workers receive intrinsic motivation from the provision of an output, the firm faces a public good problem. If the manager is very motivated to provide the output, he needs to pay the worker a higher wage to motivate effort because the worker knows that provision is likely even if he shirks. Francois argues that this is the reason why the reduced financial incentives in the for-profit firm can be attractive to a social planner. We show here that his welfare argument relies on relatively specific assumptions. In particular, it can be shown that the social planners sentiment is not shared by the manager or worker. The underlying reason is that Francois does not model a contract failure in the sense of Hansmann (1980). From the consumer's perspective the choice between not-for-profit and for-profit is irrelevant as it only entails different allocations of welfare inside the firm. This finding does not reveal itself in Francois (2000) because worker and manager self-selection are not explicitly dealt with.

The empirical relevance of worker self-selection is a known problem in

the literature on not-for-profit wages.[51] A recent demonstration of the importance has been provided by Mocan and Tekin (2003). They show that workers earn a rent in the child-care sector once worker self-selection is controlled for. However, they also show that this rent does not necessarily imply the absence of labor donations.

While the effect of competition in output markets on the sectorial mix has been discussed in the theoretical literature on not-for-profits[52] the effect of competition for workers on organizational choice remains unexplored.[53] A related paper in this respect is Besley and Ghatak (2005). In their model, mission oriented managers and workers have an interest to match with each other because this implies higher output inside the match. However, their work does not discuss the role of the nondistribution constraint in this context. The benefits from motivated agents depend entirely on the worker/manager match but are independent of the organizational form.

2.3 The Model

Before we start with the formal analysis of the not-for-profit it is useful to set the scene of the model. Consider firms in the development or health industry. Firms in these industries often receive contracts from larger organizations, like for example the World Bank or medicare in the US, that offer a fixed financial benefit for the completion of a project or provision of a health service. Regardless of the organizational form, firms typically process some hierarchical structure in which errors at the lower level of the firm can be

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[51] See for example Preston (1989) for a discussion.

[52] See for example Lakdawalla and Philipson (2006).

[53] See for example Francois (2003) orRowat and Seabright (2006) who develop arguments around the lower wage in the not-for-profit sector but do not discuss competition for workers.

compensated by the owner/manager. This implies that not only worker effort matters for output but also the motivation of the management to compensate mistakes, either by providing labor input themselves or by hiring additional other inputs. The model presented in this section abstracts from the exact mechanism by which the management can compensate for worker failure and simply models the problem as a sequential provision of costly effort.

2.3.1 Production Technology

We model a production process in which the worker and the manager exert costly effort. The worker moves first and produces a first stage output, $y_1 \in \{0, 1\}$. This intermediate output is observed by the manager who then decides on his effort. His effort determines the second stage output, $y_2 \in \{0, 1\}$. The production technology is as follows:

- The worker exerts effort, $e_W \in \{1, 0\}$.

    - If effort $e_W = 1$ then $Prob(y_1 = 1) = h$
    - If effort $e_W = 0$ then $Prob(y_1 = 1) = l = 0$

- Output, $y_1 \in \{1, 0\}$, is realized and observed

    - After observing y_1, the manager may exerts effort, $e_M \in \{1, 0\}$.

- If $y_1 = 1$ then $y_2 = 0$ for any $e_M \in \{1, 0\}$

- If $y_1 = 0$ then $y_2 \in \{0, 1\}$

    - If effort $e_M = 1$ then $Prob(y_2 = 1 | y_1 = 0) = h$
    - If effort $e_M = 0$ then $Prob(y = 1 | y_1 = 0) = l = 0$

This technology captures a situation in which the firm has to provide a target level of standardized output or project success. If the target of production is fulfilled, additional effort will have no positive effect on output.

Output yields financial returns of π. In addition, we assume that manager and worker are intrinsically motivated. In particular, we assume that the output of the project (or equivalently, the fact that the target level of output was reached) is a pure public good to the worker and the manager.[54] They receive a benefit of θ_j $(j = W, M)$ from project success independently of their own effort and the organizational form of the firm.

The cost of effort to the worker and the manager are $c(e_W) = e_W$ and $c(e_M) = e_M$. Both types of effort are unobservable. This is a particular variety of the problem of moral hazard in teams, one in which the sequential nature of the effort decisions is important. Note that we assumed that the manager has the same effort costs as the worker. This assumption is only made for simplification. The basic mechanisms pointed out here would also hold if the manager had a higher effort cost than the worker.[55]

We also assume limited liability on the part of the worker, as is standard in this class of incentive problems: the worker's wage cannot be negative. In addition, we assume limited liability on the side of the manager: wages can not exceed the existing financial benefits π. The latter assumption is made for simplicity and does not drive our main results.

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[54] To be more specific, benefits are a club good that only affects individuals involved in production.

[55] This assumption is made in Francois (2000, 2003).

2.3.2 The Manager's Problem

Before production starts, the manager maximizes his expected utility by choosing the organizational form and the wage paid to the worker. Due to the fact that there are two stages, he has the option of paying two different wages contingent on first and second stage success, w_1 and w_2.

In addition, the manager chooses whether to run a for-profit or not-for-profit firm. A not-for-profit firm is characterized by the fact that the manager cannot keep all the profit. Denote the share of profits kept by the manager by α. Here we follow the formulation of Glaeser and Shleifer (2001) of the non distribution constraint. In particular, assume that committing to non distribution means that the manager can still capture some of the profits, but the technology of doing so entails some losses (e.g., perks).[56]

In our analysis α is a choice variable of the manager. While this might not be realistic, the assumption should be regarded a modelling device that simplifies the discussion of comparative statics significantly. We will speak of a not-for-profit firm (NP) if $\alpha < 1$ and a for-profit firm (FP) if $\alpha = 1$.[57]

The managers problem before the game can then be described by

$$
\max_{\alpha, w_1, w_2} EU(e_W^*, e_M^*) =
$$
$$
\Pr(y_1 = 1 \mid e_W^*) \left[\alpha(\pi - w_1) + \theta_M \right]
$$
$$
+ \Pr(y_1 = 0 \mid e_W^*) \left[\Pr(y_2 = 1 \mid e_M^*) \left\{ \alpha(\pi - w_2) + \theta_M \right\} - e_M^* \right]
$$

subject to the manager and worker incentive compatibility constraints (dis-

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[56] See also Hansmann (1980), pp. 873-875 for some support of this possibility.

[57] Alternatively, the not-for-profit could be defined by $\alpha = 0$. We discuss this alternative in appendix B.2 and show that the not-for-profit can never dominate in this case.

cussed below) and worker and manager limited liability constraints. The latter prevent payments of $w > \pi$ and $w < 0$. Optimal worker effort, e_W^*, is a function of w, θ_W and e_M^* and optimal manager effort, e_M^*, is a function of α, w and θ_M.

2.3.3 The First Best Solution

The first best outcome maximizes total surplus. For the second stage this implies that the manager should exert effort $(e_M = 1)$ if $y_1 = 0$ and

$$h(\pi + \theta_W + \theta_M) - 1 \geq 0$$

and $e_M = 0$ otherwise. At stage 1 the worker should exert effort $(e_W = 1)$ if

$$h(\pi + \theta_W + \theta_M) - 1 + (1 - h)\{h(\pi + \theta_W + \theta_M) - 1\} \geq h(\pi + \theta_W + \theta_M) - 1$$

or

$$h(\pi + \theta_W + \theta_M) - 1 \geq 0$$

and $e_W = 0$ otherwise.

An important difference from our model to Francois (2000) is that project failure is possible even when worker effort is high. This creates benefits from high manager effort in situation in which the worker does not shirk.[58]

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[58] The difference depends on the success rate from effort, h. For $h = 1$ our model is similar to Francois (2000) set up - in equilibrium either manager or worker exert effort but never both.

In summary, the first best effort level is given by

$$e_W^{FB} = \begin{cases} 1 & if \quad h(\pi + \theta_W + \theta_M) - 1 \geq 0 \\ 0 & if \quad h(\pi + \theta_W + \theta_M) - 1 < 0 \end{cases}$$

$$e_M^{FB} = \begin{cases} 1 & if \quad h(\pi + \theta_W + \theta_M) - 1 \geq 0 \cap y_1 = 0 \\ 0 & otherwise \end{cases}$$

to avoid trivial solutions, we assume that

$$A0 : h(\pi + \theta_W + \theta_M) - 1 \geq 0$$

and so the first-best has $e_W^{FB} = 1$ and $e_M^{FB} = 1$ if $y_1 = 0$.

2.3.4 The Incentive Constraints

We start by analyzing the managers incentive to exert effort in the second stage. If the worker was successful, the manager has no incentive to exert effort as effort is costly but has no impact on output. If the worker was not successful, the manager exerts effort if

$$h(\theta_M + \alpha(\pi - w_2)) \geq 1 \tag{1}$$

where θ_M is manager intrinsic motivation, π is the financial benefit from project success and w_2 is the wage paid to the worker.

Naturally, if $h \cdot \theta_M > 1$, the manager will exert effort independent of w_2 and α (since by the limited liability assumption α cannot be negative or w cannot exceed π), and similarly, if $h(\theta_M + \pi) < 1$ the manager will never exert effort. We therefore make the following assumption

$$A1 : \frac{1}{h} - \pi \leq \theta_M < \frac{1}{h}.$$

which ensures that the commitment problem exists and can be solved through a reduction of financial incentives.

While this seems like a trivial point, it is important to note that the manager is not over-motivated to exert effort in comparison to the first best rule. To see this, note that $A1$ implies $A0$ - if the manager regards the project worth saving it must be true that his effort increases overall welfare.

There are two possible scenarios for the incentive constraints of the worker depending on whether equation (1) is satisfied or violated. If it is satisfied, the manager exerts effort in the second stage. The worker then foresees that the manager will provide effort if she fails. She exerts effort if

$$h(\theta_W + w_1) + (1 - h) h(\theta_W + w_2) - 1 \geq h(\theta_W + w_2)$$

where the second term on the left-hand side describes the worker's expected utility from failure. Rewriting this condition yields

$$h(\theta_W + w_1) - h^2(\theta_W + w_2) \geq 1. \tag{2}$$

If equation (1) is violated, the manager is committed to never exert effort. The worker knows that there will be no chance of project success if she does not succeed. She then exerts effort if

$$h(\theta_W + w_1) \geq 1. \tag{3}$$

By comparison of these two equations (and given that by the limited

liability assumption $w_2 \geq 0$) it should be clear that the worker is more motivated if she knows the manager will not exert effort. The term $h^2(\theta_W + w_2)$ in equation (2) captures the fact that the worker receives both the wage payment w_2 and her intrinsic benefit θ_W with probability h, even if she did not succeed in providing project success in the first stage.

Note that the wage payment w_2 reduces the payoff for the manager and has a negative impact on worker incentives. The only time it will be used is therefore to commit the manager to no effort.

2.4 Manager Organizational Choice

In this section we discuss the organizational choice of the manager for a given manager-worker match. We first show that the ability to commit the manager to low effort is crucial for the manager's organizational choice.

2.4.1 The Role of Commitment

Proposition 6 *If $w \leq \pi$ the not-for-profit will only be chosen by the manager if it commits him to no effort.*

Proof. Note first that if $w \leq \pi$, α reduces the profit retained by the manager and therefore the incentive to exert effort. If there are no positive effects on worker incentives, reducing α is never optimal. However, as shown in the previous section, reducing α can be used to commit the manager to no effort and change the worker IC constraint. This is the only potentially positive effect of the reduction of α and, hence, the not-for-profit form. ∎

Note that proposition 6 implies that $A1$ is a necessary condition for not-for-profit dominance. If $A1$ is not satisfied either there is no commitment problem and the for-profit is always preferred, or the not-for-profit cannot

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solve the commitment problem and, hence, can never dominate the for-profit. However, assumption $A1$ implies $A0$. In other words, the not-for-profit setting is only chosen by the manager in cases in which it moves the overall outcome away from first best effort provision.

Another corollary from proposition 6 is that a variation in the production function can make not-for-profit dominance impossible. To see this, note that a constant returns production function would imply that the managers IC constraint is independent of y_1. Worker and manager effort choices are independent in that case. But if they are independent then manager commitment has no effect on the worker's IC constraint and the not-for-profit can never dominate.

Proposition 6 makes clear that the only advantage of a reduction in α is the change of the incentive constraint of the worker. A brief look at the manager's IC constraint reveals, however, that a reduction of financial incentives through α is not the only way to commit. In fact, one can show that the manager will typically find a second stage wage payment, $w_2 > 0$, more attractive.[59]

In our analysis, we therefore focus on the case in which the manager can only pay a wage contingent on intermediate output, i.e. we assume $w_2 = 0$.[60] This relates our contractual assumptions to those made by Francois (2000). He assumes that output is not contractible and that the manager pays an efficiency wage to the worker. While conceptually quite different, the incentive effect of an efficiency wage and a wage payment contingent on

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[59]We show this in appendix B.1.

[60]A way to understand this contractual environment is to assume that the manager sub-contracts the project to the worker and agrees on a bonus payment contingent on the fulfillment of that contract. If the worker fails, the contract ends and the manager can exert effort or let the project fail. In this setting verifyability is likely linked to 'project ownership'.

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intermediary output are similar.

2.4.2 Optimal Wages and Profit Share

With $w_2 = 0$, the IC of the manager in the second stage becomes

$$h\left(\alpha\pi + \theta_M\right) \geq 1$$

and given $A1$, commitment to no effort is only possible in the not-for-profit firm. The manager receives the maximum payoff when committing if he chooses α such that this condition is just satisfied with equality. The optimal α is therefore given by

$$\alpha^* = \frac{\frac{1}{h} - \theta_M}{\pi}$$

where $\alpha^* < 1$ exists by $A1$.

The purpose of reducing the residual claimancy is the commitment of the manager to no effort. Given that the manager committed, the worker's incentive compatibility constraint is

$$h\left(w_{NP} + \theta_W\right) \geq 1$$

and the optimal wage payment in the not-for-profit is

$$w_{NP} = \frac{1}{h} - \theta_W.$$

In the for-profit firm the manager cannot commit not to exert effort. Absence of commitment means that the worker knows that if she fails to provide effort, there is still a probability of h that the project succeeds. Her incentive compatibility constraint is therefore modified to

$$h\left(w_{FP} + (1-h)\theta_W\right) \geq 1$$

and the resulting wage payment needed to make the worker exert effort is

$$w_{FP} = \frac{1}{h} - (1-h)\theta_W$$

As $h \leq 1$, it is clear upon inspection that $w_{FP} \geq w_{NP}$. The crucial difference between for and not-for-profit wages is that intrinsic motivation reduces the needed wage payment less in the for-profit. This wage difference to the not-for-profit is driven by our assumption on output related intrinsic motivation. The worker knows that, should she fail, she will still receive θ_W with probability h because the manager exerts effort by $A1$.

This crowding-out of worker intrinsic motivation is what motivates the manager to decrease his own financial incentives through a reduction of α. He knows that by committing to no effort in the second stage, the intrinsic motivation of the worker will be utilized more efficiently. If the wage reduction implied by commitment is higher than the loss of profit induced by the reduction in α the manager will choose the not-for-profit.

We restrict attention to the case where the worker's and managers limited liability constraints do not bind. As $w_{FP} \geq w_{NP}$ it is sufficient to assume:

$$A2 : \frac{\frac{1}{h} - \pi}{1 - h} \leq \theta_W \leq \frac{1}{h}.$$

as this implies $w_{NP} \geq 0$ and $\pi \geq w_{FP}$.

It can be shown that the for-profit manager will always want to pay the wage w_{FP} to motivate the worker if $A1$ holds.[61] This finding is important as

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[61] For a proof see appendix B.3.

it confirms that the for-profit firm is efficient while the not-for-profit is not - financial motivation is good for welfare. A financially motivated manager wants to pay a high wage to the worker and exert effort himself.[62]

2.4.3 Manager Preferences

We have shown in the previous section that the for-profit achieves the first-best. Still, because wages are higher in the for-profit, it might be that the not-for-profit is chosen by the manager.

Proposition 7 *Assume A1 and A2. If wage payments can only be made contingent on the intermediate output, the not-for-profit set-up is preferred by the manager if and only if*

$$h\theta_W > \left[\pi + \theta_M - \frac{1}{h}\right]\left[2 - h + \frac{\theta_W - \frac{1}{h}}{\pi}\right] \tag{4}$$

Proof. Since the manager has no way to commit to no effort in the for-profit we only have to compare two options (given $A1$). Either the manager chooses a not-for-profit firm and commits to no effort in the second stage or he pays the worker a higher wage w_{FP} and does not commit. The manager prefers the not-for-profit if

$$h(\alpha^* (\pi - w_{NP}) + \theta_M) > h(\pi - w_{FP} + \theta_M) + (1 - h)[h(\pi + \theta_M) - 1]$$

inserting the optimal wages and α^*

$$\frac{\frac{1}{h} - \theta_M}{\pi}\left(\pi - \frac{1}{h} + \theta_W\right) > (\pi - \frac{1}{h} + (1 - h)\theta_W) + (1 - h)\left[\pi + \theta_M - \frac{1}{h}\right]$$

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[62] This case has been ignored by Francois (2000) due to the particular assumptions on the equivalent of h in his model. Higher effort costs for the manager only play a role for the distribution of welfare between worker and manager.

or

$$h\theta_W > \left[\frac{\pi + \theta_M - \frac{1}{h}}{\pi}\right]\left(\pi + \theta_W - \frac{1}{h}\right) + (1-h)\left[\pi + \theta_M - \frac{1}{h}\right]$$

simplification of this term yields equation 4. ∎

Proposition 7 contains several interesting comparative statics that we will analyze in the following sections. Before we discuss equation 4 formally, however, we present a visual representation of the condition. Figure 6 shows the $\theta_W - \theta_M$ parameter space for an example.[63] The dark surface represents the manager's expected utility from the for-profit while the light surface represents the expected utility from the not-for-profit. Equation 4 describes the line in which both planes intersect.
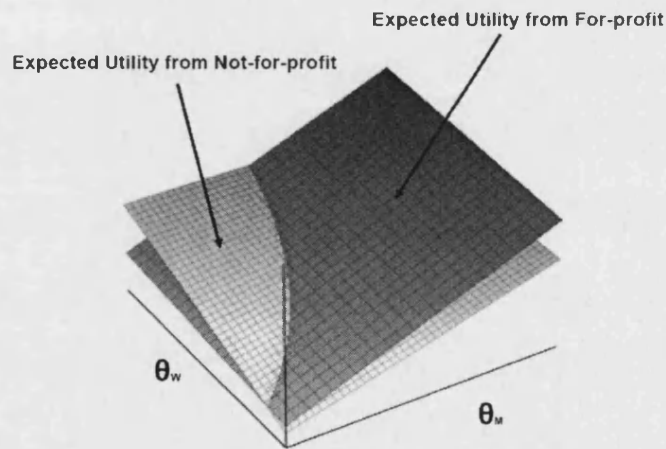

Figure 6: Manager Expected Utility

Figure 6 shows that not-for-profits are only attractive for relatively low values of θ_M in combination with relatively high values of θ_W. In particular,

the graph shows that not-for-profits never dominate if $\theta_W = 0$. This is a direct result of the fact that commitment to no effort makes only sense if it implies wage savings for the manager. If $\theta_W = 0$ wages are the same in both organizational forms and the for-profit is chosen for all θ_M.

The Effect of Financial Benefit   How does the financial benefit of the project, π, affect the choice of the manager? It is useful to think about this comparative static with the help of equation (4). Write the difference of expected utility between for- and not-for-profit

$$U_{FP} - U_{NP} = h(\pi - w_{FP} + \theta_M) + (1-h)\left[h\left(\pi + \theta_M\right) - 1\right] - h(\alpha^*\left(\pi - w_{NP}\right) + \theta_M)$$

the for-profit firm is benefiting more from increasing π if

$$\frac{\delta U_{FP} - U_{NP}}{\delta \pi} = h + h(1-h) - h\alpha^* - h\frac{\delta\alpha^*}{\delta\pi}\left(\pi - w_{NP}\right) > 0$$

which is always the case as $\alpha^* \leq 1$ and $\frac{\delta\alpha^*}{\delta\pi} < 0$. The for-profit firm becomes more attractive with increasing financial benefits because the manager is the full residual claimant of these benefits while in the not-for-profit he has to give up an increasing share.

The Effect of Worker Intrinsic Motivation   Worker intrinsic motivation has an ambiguous impact on institutional choice. If we compare the marginal effect of θ_W on expected utility we can see that the for-profit becomes more attractive with increasing worker intrinsic motivation if

$$\alpha^* < 1 - h \tag{5}$$

which has the following intuition. Under the not-for-profit, worker intrinsic motivation directly reduces the wage payment. The manager, however, does not fully capture the benefits of this reduction because $\alpha^* < 1$. In the for-profit, the manager is the full residual claimant but intrinsic motivation only reduces the wage at the rate $1 - h$. As long as $\alpha^* \geq 1 - h$ the not-for-profit benefits more from highly motivated workers. If $\alpha^* < 1 - h$, however, the for-profit can benefit more from the worker's intrinsic motivation.

While this effect might look like a rather specific characteristic of our model it points to a more general finding. If not-for-profits indeed fulfil the purpose of reducing financial incentives, they also reduce the incentive for managers to reduce production costs. This implies that wage reductions gained from worker intrinsic motivation are appreciated less by managers in not-for-profit firms.[64] Equation (5) shows that this effect can dominate the higher impact of intrinsic motivation on wages in the not-for-profit.

The Effect of Manager Intrinsic Motivation   The impact of manager intrinsic motivation on equation 4 is clear. With rising manager intrinsic motivation, the not-for-profit is becoming less attractive. While this is somewhat surprising in the light of the discussion on not-for-profit firms is has a simple intuition. The not-for-profit penalizes strong intrinsic motivation because more financial benefit has to be given up to keep the manager committed to no effort. In contrast, for the for-profit, the expected payoff (which includes both pecuniary and non-pecuniary payoffs of the manager) is increasing in the manager's intrinsic motivation.

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[64]The case of $\alpha = 0$ discussed in the appendix B.2 is confirming this intuition.

2.5 Labor Markets and Organizational Choice

Up until now we assumed that workers and managers are matched exogenously with one another. In sectors that feature labor mobility or flexible organizational form this assumption is not realistic. To model the effects of the labor market on organizational choice, we have to allow for an endogenous matching between managers and workers. We maintain the assumption that managers choose the institutional arrangement and that binding contracts can be written in this regard.

Throughout the section we assume the following equilibrium concept. A matching between managers and workers is an equilibrium if no manager or worker is able to make an offer to another worker or manager that makes both (weakly) better off. We assume that a manager or worker that is matched with herself (unemployment) will always receive a payoff of zero.

Before we start with the analysis it might help to develop some intuition of what will happen with endogenous matching. Up until now we have focused on the incentives of the manager to choose one organizational form or another. The most important change to this perspective is that endogenous matching introduces an additional element of choice on the side of the worker. This is important because not-for-profits can be attractive for the manager but not necessarily for the worker. If managers compete for workers in the labor market, that can affect institutional choice. In order to be able to discuss endogenous matching, we therefore discuss worker preferences first.

2.5.1 Worker Preferences

Assume $A1$ and $A2$ hold and contracts can only be written on intermediate output. The worker's utility (when exerting effort) is then

$$U_W = h(\theta_W + w_1^*) + (1-h)\, p_M \theta_W - 1$$

where $p_M = 0$ in not-for-profits (because of commitment) and $p_M = h$ in for-profits (by $A1$). Given optimal wage setting in both organizational forms the following holds.

Proposition 8 *An intrinsically motivated worker, $\theta_W > 0$, always prefers to work in a for-profit firm.*

Proof. If the manager chooses a not-for-profit, the optimal wage payment from the perspective of the manager is

$$w_1^* = w_{NP} = \frac{1}{h} - \theta_W$$

and the utility of the worker for this case is therefore

$$U_W^{NP} = h(\theta_W + \frac{1}{h} - \theta_W) - 1 = 0$$

where the level of expected utility is simply the result of the binding IC constraint of the worker. In the for-profit firm the does not commit and the worker receives a (higher) wage payment of

$$w_1^* = w_{FP} = \frac{1}{h} - (1-h)\theta_W.$$

with this wage plugged in and $p_M = h$ the worker's utility is

$$U_W^{FP} = h(\theta_W + \frac{1}{h} - (1 - h)\theta_W) + (1 - h)\, h\theta_W - 1$$

which simplifies to

$$U_W^{FP} = h \cdot \theta_W > U_W^{NP}$$

∎

Proposition 8 confirms that the contractual failure modelled here implies a conflict of interest between manager and worker. Even if both organizational forms were equally efficient, the conflict would persist. To some degree, the not not-for-profit is simply a costly way to commit to free-riding for the manager and, hence, the organizational form is never preferred by the worker.

While the worker's preference does not matter (by construction) in the exogenous matching case it can now drive organizational choice if workers are scarce and enjoy market power in the endogenous matching.

2.5.2 Equilibrium with Two Types of Workers

In this section we demonstrate the effect of worker scarcity on the labor market at the example of two worker types. Assume a number a_1 of motivated workers ($\theta_W = \hat{\theta}_W > 0$) and a number a_2 of unmotivated workers ($\theta_W = 0$).

Assume a number of heterogenous managers m with intrinsic motivation $\theta_M \in \left[\frac{1}{h} - \pi, \frac{1}{h}\right]$. We distinguish two groups. Denote the number of

managers for which equation (4) is satisfied if the worker is motivated

$$h\hat\theta_W > \left[\pi + \theta_M - \frac{1}{h}\right]\left[2 - h + \frac{\hat\theta_W - \frac{1}{h}}{\pi}\right]$$

by m_1. These managers will choose a not-for-profit when matched with a motivated worker.[65] Denote the remaining managers by m_2, where $m_1 + m_2 = m$.

Full employment

Proposition 9 *Assume that labor is scarce ($a_1 + a_2 < m$). Given A1 and A2 there are only for-profit firms in a stable matching.*

Proof. Given $A2$ (and $\theta_W = 0$) we have that $\pi \geq \frac{1}{h}$ and unmotivated workers exert effort if they are paid $w_1 = \pi$. The worker's market power implies that wages in the industry are

$$w_1 = \pi$$

regardless of the match. To see this, note that all managers exert effort in the second stage and therefore (weakly) prefer to be in a for-profit to unemployment. Given this pressure from idle managers, no manager in a match can afford to pay a wage $w_1 < \pi$. Given the wage, managers (weakly) prefer the for-profit setting to the not-for-profit because

$$h(\pi - \pi + \theta_M) + (1 - h)\left(h(\pi + \theta_M) - 1\right) \geq h(\alpha\,(\pi - \pi) + \theta_M)$$

for all θ_M. Lastly, managers and workers earn a rent that is independent of

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[65] Given the analysis in section 2.4.3, no type of manager wants to be in a not-for-profit firm with an unmotivated worker.

the match and we therefore have no sorting in this case. ∎

Worker Unemployment

Proposition 10 *Assume that there is unemployment amongst motivated workers ($a_1 \geq m$). Given A1 and A2, all unmotivated workers ($\theta_W = 0$) are unemployed and there is a not-for-profit sector of size m_1. Not-for-profit firms pay a lower wage than for-profit firms. The size of the not-for-profit sector is decreasing in the financial benefits, π, that can be gained in the industry.*

Proof. If $a_1 \geq m$, managers are able to select their preferred organizational form because they face no competition for motivated workers. This implies that the size of the not-for-profit sector is given by the set of manager for which equation (4) is satisfied, m_1. The wage payments are given by the respective IC constraints. Since the not-for-profit sector commits managers to no effort, wages are lower than in the for-profit sector for a given level of $\hat{\theta}_W > 0$. The size of the sector shrinks with rising financial benefits because equation (4) is harder to satisfy if π increases. ∎

Note that equation 4 can be fulfilled for relatively unmotivated managers but not for too motivated managers. In such an equilibrium, highly motivated managers create for-profit firms and pay a wage w_{FP} to workers. Unmotivated managers create not-for-profits and pay $w_{NP} < w_{FP}$.

Proposition 11 *Assume $a_1 + a_2 \geq m$ but $a_1 < m$. Given A1 and A2 there are only for-profit firms in a stable matching.*

Proof. There is now some degree of competition for motivated workers since all managers prefer to have motivated workers in their firms. This implies

that we have full employment for all workers with $\theta_W = \hat{\theta}_W$. Note, that all managers offer the same expected utility, $h\theta_W$, to the worker if they hire into the for-profit. Given that motivated workers can always get managers out of a match with an unmotivated worker, their preferred organizational form, the for-profit, dominates. To see why not-for-profits would not survive, imagine all motivated workers are in a match with managers in a not-for-profit firm. By $a_1 < m$ there will be some managers who are in a for-profit with an unmotivated worker. These managers are then willing to offer a for-profit match to a motivated worker that makes the worker strictly better off. Not-for-profits cannot survive this labor market pressure. ∎

In this section we have shown that scarcity of motivated workers always implies that not-for-profit firms disappear because they cannot compete with the higher wage payments and higher chances of project success in the for-profit sector. Not-for-profits can only survive as an organizational form if managers have strong market power in the labor market and only if equation (4) is fulfilled for at least some managers, i.e. only if the project in question is financially not too attractive, the worker sufficiently motivated and the manager not too much.

2.6 Conclusion

Volunteering is particularly common in the not-for-profit sector. A possible explanation is that reduced financial incentives for the manager elicits intrinsic motivation of the workers. We evaluate this argument in the context of a model of double-sided moral hazard, where the manager and the worker move sequentially. Our main contribution to the existing literature is that we evaluate the argument in a setting where manager and worker

can self-select into organizational forms.

First, we show that for the manager to choose a not-for-profit, it needs to provide commitment for the manager not to exert effort. If the commitment problem is either not important or impossible to solve, the for-profit is the only relevant choice. This implies that the not-for-profit set-up is chosen by the manager if he is not very motivated. Both high financial benefit and high intrinsic benefit increase the attractiveness of the for-profit form. The reason is that the not-for-profit set-up provides low wage costs by using worker intrinsic motivation effectively but does so at the cost of efficiency and lower financial returns to the manager.

We show that high worker intrinsic motivation can make both the not-for-profit and the for-profit relatively attractive, depending on the level of the motivation of the manager. If the manager is not very motivated, the comparative statics confirm the intuition that the not-for-profit sector benefits more from intrinsically motivated workers. If the manager is very motivated, though, this effect is dominated by another, more subtle one. Reducing the share of profits that go to the manager reduces the benefits from cost savings. This implies that the wage reduction due to worker intrinsic motivation might be appreciated more by a for-profit manager than a not-for-profit manager. The impact of intrinsic motivation on wage costs is lower in the for-profit but the manager captures the full benefit.

Recent empirical findings in Mocan and Tekin (2003) square well with our theoretical results. They study employer-employee matched data on child care workers and account for self-selection into organizational forms. The authors present a table of means of worker characteristics in the not-for-profit and for-profit sector and run a test for significant differences. They find no difference in terms of intrinsic motivation between the two groups.

At the same time, however, their wage estimates indicate that intrinsic motivation lowers wages by more in the not-for-profit sector. These two results can be explained with our theory.[66] First, for a given set of worker and, hence, labor market characteristics, wages are lowered more by intrinsic motivation in the not-for-profit sector. Secondly, this does not mean that the more motivated workers will end up in that sector as managers in the for-profit sector might appreciate motivated labor more than managers in the not-for-profit sector.

Additional insights can be gained from our endogenous matching results. Put somewhat provocatively, the high degree of not-for-profit organizations in some sectors could be the result of a combination of unattractiveness of projects and the abundance of motivated workers. If managers are financially or intrinsically motivated they will switch to for-profits instead. And if motivated workers have some market power in the labor market they will encourage the creation of for-profit firms that offer higher wages and higher productivity.

A real life example might illustrate this point. There is a quickly growing industry of volunteer tourism which combines typical backpacking trips with development work. In this sector, not-for-profit firms provide local development work for the traveler. Most of the field work requires only uneducated labor, available in abundance in the local community. Still, volunteers are intrinsically so motivated that they are willing to pay the organization to get work. The websites organizing the market indicate that the impact of the volunteer is an important consideration for this willingness to pay.[67] In

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[66] Their main result - the positive rent earned by workers in the not-for-profit sector - could also be incorporated in our model. Workers need to earn a rent to be compensated for the loss of project success probability caused by manager commitment.

[67] Google adds for the search voluntourism read for example: *'Make a real difference.*

other words, the labor market features payments from the worker to the organization (a negative wage) in return for the opportunity to *make a difference*. The nondistribution constraint ensures that the firm management does not interfere with whatever the volunteer leaves behind and, hence, ensures that the volunteer is left to his own devices. His labor input is then essential for the success of the project and the not-for-profit can reap the full financial benefits of the volunteer's intrinsic motivation.[68]

While this is a rather specific example, it suggests a mechanism that links intrinsic motivation and the rise of not-for-profits in some sectors. If the forces at work under endogenous matching are relevant, the abundance of motivated labor in some sectors may induce the rise of not-for-profit organizations. But this is not because motivated workers prefer to work in not-for-profits, but because the excess supply of motivated workers make the non-profit form more attractive to managers.

If the labor market is segmented into different groups, we would expect groups with relatively little opportunities in the market to be more prone to not-for-profit employment. The fact that particularly not-for-profits specialize in employing an old workforce could be regarded as one indicator that this is not too far fetched.[69] Furthermore, our endogenous matching results are supported by a striking pattern in the worker characteristics data of Mocan and Tekin (2003) mentioned above. According to their tests, Blacks and Hispanics seem to be significantly overrepresented in not-for-profit firms while Whites and workers with college degree are underrepresented. Our theory

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Volunteer abroad. 1-12 weeks. Year-round.' or *'Volunteer Abroad. Make a difference. Work with kids, wildlife, rainforest conservation.'* There is even a book with the revealing title: *'Volunteer Tourism: Experiences that Make a Difference.'*

[68] We would expect not-for-profits to charge more and provide less successful projects in this context. Two corollaries that might be empirically testable.

[69] For an example see http://www.ses-bonn.de/en/

suggests that this fact is not driven by the stronger interest of Blacks and Hispanics in not-for-profit work but by their weaker labor market position.

Our theoretical findings are based on the assumption that intrinsic motivation is output based and not related to a second dimension like consumer welfare or quality. This implies that managers and workers benefit from the higher financial returns of the for-profit because it leads to higher production. Financial incentives do not harm consumer/donor welfare either - whoever benefits from the project also just cares about project success. Clearly, these assumptions directly contradict the basic assumptions of contract failure as envisaged by Hansmann (1980). Not surprisingly then, the derived picture of not-for-profit firms is a relatively grim one.

This points to a general feature of the argument by Francois (2000). The not-for-profit in his (and our) model is not chosen as a remedy for contractual failure between manager and consumers or donors but it is chosen because it changes the internal balance of power between manager and worker. This view on the not-for-profit stands in some contrast to the usual idea of *contract failure*. One way to see this is to relabel the worker as (labor) donor. In our model, the not-for-profit commits the manager to stay idle if the *donor* fails to donate a sufficient amount. This commitment leads to more donations which in turn makes the manager choose the not-for-profit in some circumstances. While this view might not be too unrealistic in some circumstances, it cannot provide a justification for subsidies and tax cuts for not-for-profits.

3 Treat as Neutral: The Norm of Political Neutrality in State Bureaucracies

We should never let Ministers get so deeply involved. Once they start writing the draft, the next thing we know they'll be dictating policy.

- Sir Frederick Stewart, Permanent secretary in the TV-series "Yes Minister"

3.1 Introduction

In most state executives, elected officials are a minority. They are far outnumbered by thousands of civil servants who pursue a career in public office. While these bureaucrats are sometimes portrayed as only implementing the decision of their political masters, their true obligations are far more diverse and even reach up to drafting entire pieces of legislation.[70] In this article, we study the role of the bureaucrat as an advisor to the elected official. A role that is most obviously played within the ministries and its departments and is of crucial importance for a functioning government.[71]

The reason that civil servants work as advisors to the elected official is their often considerable edge in relevant knowledge. As one of the first scholars, Max Weber observed that this advantage in expertise is a mixed blessing. In Weber (1988), he stresses that specialized knowledge existing within the bureaucracy cannot be perfectly controlled by an uninformed principal. If bureaucrats have different political interests than their superiors, the resulting political conflict can harm effective cooperation between the bureaucrat and the politician. The potential problem is described, for

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[70] See for example Page (2003) on a reveiling study conducted in the United Kingdom.

[71] See Hart and Wille (2006), Dolan (2000), Dowding (1995), Ingraham (1987) and Putnam (1973) for evidence on the importance of this function in a different time and country settings.

example, by Sir John Hoskyns, policy advisor to Margaret Thatcher. In his analysis of the role of British bureaucracy he writes about the role of the civil servant

[...] it must never be suggested that his efforts might contribute in the end to electoral success for his political masters. If he started to worry about it, his position would soon become impossible. For the only way he could be sure that he was not furthering his minister's political aims would be to lean in the other direction- perhaps to the extent of low-key political sabotage! But of course most ministers suspect he is doing that half the time anyway...[72]

What are the institutional answers to this problem? One feature that is often mentioned in this context is the norm of *political neutrality* of the bureaucrat.[73] At first sight this seems more like an attempt to assume the problem away than a solution - impartiality is hard to implement if the bureaucrat cannot be controlled. And indeed, there is some consensus that a *rational* bureaucracy, a bureaucracy that works as a perfect tool for the politician, remains out of reach.[74] However, this does not prevent the normative message of a neutral civil service to be strongly heard.[75] We explain here how *political neutrality* could be re-interpreted to explain its survival. *Neutrality* could be the prescription to keep political viewpoints hidden. If bureaucrats are not supposed to make their views public, less is known about these views.

This article shows that by inducing secrecy, the norm of political neutrality can partially defuse the conflict between politicians and bureaucrats

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[72] Hoskyns (1982), p. 144-145

[73] See for example the US Congress, House Committee on Post Office and the Civil Service (1976).

[74] See Smith (1988) for a more elaborate argument.

[75] Peters (1995) notes this astonishing survival of what he calls an *ancient proverb* and argues that it must come as an advantage to both politicians and civil servants.

without actually making the individual bureaucrat politically neutral. Our analysis of this problem is based on a simplified version of the cheap talk model introduced by Crawford and Sobel (1982). We show that communication between a bureaucrat and a politician can improve if the politician does not know the bureaucrat's preference. The reason is that if the preference of his bureaucrat (sender) is unknown, the politician (receiver) has to interpret the signal sent by the bureaucrat with his conditional beliefs, i.e. an (updated) average of possible bureaucrat preferences. He will therefore tend to trust a bureaucrat with non-aligned interests more than he would if he knew her preferences. This in turn gives the bureaucrat less incentives to distort her report and improves communication. The benefits of this improvement can be so substantial that they balance the fact that the bureaucrat can now manipulate the politician. It is then beneficial to both bureaucrat and politician to keep the bureaucrat's preferences hidden.

The structure of the article is as follows. We first present related literature. Section 3.3 then presents a simplified version of the model by Crawford and Sobel (CS) with observable types. We show that, despite its simplicity, our version of the model allows for a discussion of the arising inefficiencies in the sender-receiver game. Section 3.4 analyzes the role of commitment in improving communication between the politician and the bureaucrat. Building on these findings, we introduce a model of communication with unknown types and present our main results in section 3.5. Section 3.6 concludes.

3.2 Literature

This article relates to an extensive body of articles both through the framework chosen and the question it tries to answer. In this section we first

discuss our assumptions on the contractual environment in the context of related literature. We then review the quickly growing literature that modifies CS and pay special attention to several recent contributions that overlap with our theoretical analysis.

Crawford and Sobel (1982) assume that the sender and receiver of communication share a broad policy objective - an action that can only be taken by the receiver but affects both parties. This shared effect of the action gives an intrinsic incentive to the informed sender for meaningful communication, without the need for any contractual arrangement or reputation concerns.

One of the main contributions of Crawford and Sobel is to show that communication becomes less precise with growing bias of the sender. They argue that while a perfectly aligned sender is able to communicate fine nuances of the state of the world, a biased sender is only able to tell the receiver that the state is within a certain interval - the more biased the sender, the coarser the partition of the message space. We fix the amount of messages that are sent in equilibrium and show that communication still suffers in efficiency with rising bias. The reason is that the message space is skewed increasingly with rising bias - some states of the world can be communicated more precisely than others.[76]

Aghion and Tirole (1997) study a very similar situation but endogenize the amount of information the sender and receiver have. In their framework, the incentive to collect information and communicate comes from two sources. Similar to CS they assume that incentives are partially aligned. The best option for the decision-maker (advisor) also yields weakly positive utility to the advisor (decision-maker). In addition, they assume the ex-

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[76] It should be noted that this effect establishes a connection to Cukierman and Tommasi (1998).

istence of a very bad option that prohibits blind choosing of a project on the side of the receiver. A conceptually crucial difference to the analysis provided here is that Aghion and Tirole focus on the optimal allocation of decision rights. They follow the incomplete contract theory in pointing out that the allocation of authority can be re-interpreted as ownership of an asset or a contract arrangement that give the decision-right. This formally allocated authority is undermined by the presence of superior information with the agent. Their proposal is to delegate formal authority.

This basic policy prescription is shared by Dessein (2002). He transfers the question of optimal allocation of authority into the cheap talk framework and shows that it can be beneficial for the decision-maker to accept the loss of control. The driving factor behind his result lies within the particular mechanism at work in cheap talk games that we analyze in section 3.3. Despite the shared origin of our and his results there are considerable differences in the assumptions we make on the contractual environment.

Dessein (2002) assumes that while contracts cannot be written, the allocation of decision rights is possible within organizations. This allocation of a decision right could be reached through the ownership of assets[77] or the access to critical resources[78] and might be partially possible in state bureaucracies.[79] In this context our results can be regarded as an additional option - even in the absence of a direct commitment device, the absence of information can improve efficiency.

Note that parallel to the controversy in the economics literature there is

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[77]For a link between asset allocation and decision right see Grossman and Hart (1986) and Hart and Moore (1990).

[78]See Rajan and Zingales (1998) for a related argument.

[79]The informal allocation of decision rights and the constant struggle this entails can be observerd in the TV-series "Yes Minister" from which we drew our entry citation.

a similar discussion in political science. Several authors have argued for an application of a theory relying on incentive contracts to analyze bureaucracies.[80] This literature analyzes the institutional setting in which bureaucrats act and try to show their impact on the incentives of civil servants. This approach faces some criticism. Page and Jenkins (2005), for example, argue in their study of middle ranking civil-service in the United Kingdom that if institutional arrangements become sufficiently vague or informal, enforceability is questionable. They reason that the *principal-agent approach* is therefore not fit to address the reality as it appears in their study. We hope that the cheap talk framework might fill part of the gap left by these concerns. Even without relational contracts, cooperation between politician and bureaucrat can be possible because both are working towards the common goal of formulating effective policy.

Recent years have seen a lively interest in variations of the cheap talk game. Given that our analysis cannot be nested in any of them, we see our contribution in complementing and expanding the existing research. In addition, the similarity to some of the results presented here give us confidence that our model could be generalized beyond its convenient form.

Both Li (2004) and Morgan and Stocken (2003) derive communication equilibria in a type space of two sender types $(0, b$ and $-b, b)$ and no restrictions on the signalling space. Depending on the magnitude of the bias, b, their equilibria can be separated in two categories. The first follows CS and separates the message space in N sub-categories with both types sending signals only on these categories. The second equilibrium category allows for a range of states in which the action follows the specific message sent. However, these equilibria seem to rely heavily on the restriction of the type

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[80]See, for example, McCubbins et al (1987) or Huber (2000).

space. The decision-maker follows the message sent by the bureaucrat only for some values and has to know exactly where to stop following the advice. In a richer type space an interpretation of signals along these lines seems unlikely.[81]

The first type of equilibrium, however, shares some features with the equilibrium presented here. This is not surprising as our restriction to a $N = 2$ signalling space can be reached endogenously for some values of b. How exactly these different assumptions fit together is hard to say without a rigorous generalization. More importantly, the welfare implications of the two approaches seem to differ significantly. In the restricted type space of Li (2004), ignorance of the decision-maker towards the type of his bureaucrat weakly dominates knowing the type. In our model this is not the case.

Dimitrakas and Sarafidis (2005) present a revealing generalization of the framework discussed by Morgan and Stocken (2003). They specify the nature of all possible equilibria for every distribution of types with support $[0, 1]$. Interestingly, their strategy description for the sender is very similar to the one discussed here, despite the more complex message space they allow for. While their results are more general in that respect, they restrict their attention to positive biases of the sender. More importantly, perhaps, Dimitrikas and Sarafidis (2005) do not discuss any welfare implications. The question on whether the type of the bureaucrat should be known or unknown remains unanswered.

The results presented here relate to a very general finding in economics. A second best situation can be made better by adding further inefficiencies. The effect of adding further noise to the standard cheap talk model has been

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[81] In fact the Dimitrikas and Sarafidis (2005) confirm this suspicion in their discussion of Morgan and Stocken (2003).

first brought forward by Myerson (1991). In his example, a dove is used as an unreliable device for cheap talk communication and actually improves it. This idea has been explored in two recent articles, Blume, Board and Kawamura (2007) and Kawamura (2006). Kawamura (2006) relates most closely to ideas presented here. He studies a whole class of cheap talk games that share a similar outcome in terms of equilibrium strategies and welfare implications. Most importantly for the analysis presented here, Kawamura discusses the role of commitment of the receiver for improving communication. In his framework, this commitment is reached through multiple senders and assuming particular institutional settings (anonymity, equal treatment etc.). While these institutional arrangements come at a high cost for the decision maker, they can be beneficial if they improve communication sufficiently. The main difference of our work is that we do not assume multiple senders to create commitment but asymmetric information about the sender type.

3.3 Benchmark - Type Observable

This section serves as an introduction to our notation and represents a first building block for our analysis in section 3.5. We first discuss our simplified version of the cheap talk game with known types. Despite significant simplification of the CS framework, their main result is maintained. Communication between bureaucrat and politician deteriorates with increasing bias and completely breaks down if the bias is too large. The mechanism driving this result is a vicious circle of exaggeration by the bureaucrat and mistrust by the politician.[82] It is this re-enforcing problem of mistrust and

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[82]The citation in the introduction captures large parts of the intuition for this finding.

exaggeration that is central to the gains from commitment and, hence, unobserved types.

3.3.1 Game Description

The model has two actors - a politician (*pol*) and a bureaucrat (*bur*). While the bureaucrat has some potentially useful information she cannot take a decision by herself but sends a signal, n, to the decision maker who then takes an action $x \in \mathbb{R}$. We write the utility of the politician

$$U_{pol} = -\,|m - x|$$

where m denotes the state of the world and is assumed to be uniformly distributed on $[0, 1]$. Given this utility function, the politician maximizes his expected utility by matching his action x to his conditional expectation of state of the world $E\,[m \mid n]$.

We assume that the bureaucrat is biased from the viewpoint of the politician in that she always prefers an action that is b higher (lower) than his preferred action. When sending her signal, she therefore maximizes the value of

$$U_{bur} = -\,|m + b - x|$$

where b is drawn from a known distribution $f(b)$. In order to simplify the analysis we assume that $f(b)$ is symmetric around zero.[83]

It is important to note that our assumptions about the utility function do not drive the mechanics of this model. In particular, the canonical case of a square utility function delivers very similar results in terms of equilib-

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[83] For a discussion of this important assumption see the conclusion.

rium strategies. However, the formulation of a closed form solution of the equilibrium and the discussion of welfare are facilitated considerably by this assumption.

We simplify the cheap talk game of CS by assuming that while the politician can take any action $x \in \mathbb{R}$, the bureaucrat can only send two different signals $n \in \{high, low\}$. This assumption is clearly restrictive and lowers overall efficiency. However, we can show that equilibrium outcomes of the game still reflect the basic logics of CS.

In summary, the game structure is as follows

- The type of the bureaucrat is publicly drawn from $f(b)$.

- Information m is revealed to the bureaucrat.

- The bureaucrat sends a signal, $n \in \{high, low\}$, to the politician.

- The politician chooses an action x.

3.3.2 Equilibrium Strategies

Note that the game structure perfectly matches the one described in CS. This section therefore follows their model of communication and translates their findings into the present framework. For now, our only departure from their framework remains the assumption that the bureaucrat (sender) will always partition the message space into two subintervals and send a signal only on these intervals.

In what follows, we focus on pure strategy equilibria. We further disregard the possibility of a *babbling* equilibrium for small $|b|$.[84] Given these two

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[84] See CS for a defence of this assumption. In our context of a restricted message space it seems even more plausible because the institutions that determine the message space might also determine expectations of sender and receiver.

additional assumptions we can differentiate between two cases. If $|b| < \frac{1}{4}$, communication between the bureaucrat and politician is meaningful, i.e. the signal sent by the bureaucrat contains useful information for the politician. As $b > \frac{1}{4}$ the two individuals involved in the communication diverge too strongly in their interests to allow any meaningful communication in equilibrium and only the *babbling* equilibrium remains.

Small bias $(|b| < \frac{1}{4})$ In the last stage of the game the politician takes an action x so to maximize his utility given his conditional beliefs on m. Given his utility function, the politician's actions simply match his conditional beliefs on the state m. Equilibrium actions are

$$x^*(n) = E(m \mid n), \ n \in \{high, low\}$$

Note that since we restricted the message space to two different signals there can only be two distinct equilibrium actions triggered by these signals. Denote the two equilibrium actions $x_l \equiv x^*(n = low)$ and $x_h \equiv x^*(n = high)$.

How does the conflict of interest, b, between bureaucrat and politician affect these equilibrium actions? Given that the difference in ideology is observed, the politician knows that the bureaucrat is biased and sends distorted signals from the politician's point of view. For any pair of equilibrium actions x_l, x_h the biased sender will have a clear preference for one of them at a point where the receiver is indifferent.

If the bureaucrat's bias, b, is positive for example, she gives a signal towards x_h in situations in which the politician prefers x_l. The politician anticipates this behavior and *discounts* any signal coming from a biased

bureaucrat. The bureaucrat reacts by distorting his signals accordingly.

Proposition 12 *Assume $|b| < \frac{1}{4}$. In a communication game with perfect information on bureaucrat type, equilibrium actions of the politician are $x_l = \frac{1}{4} - b$ and $x_h = \frac{3}{4} - b$. The bureaucrat sends a signal $n = low$ for all $m \in [0, \frac{1}{2} - 2b]$ and $n = high$ otherwise.*

Proof. For a proof of the proposition see the appendix C.1. ∎

Note two interesting features of this equilibrium. First, the politician skews his actions in the opposite direction of b. He does so in an anticipation of the incentives of the bureaucrat to bias her signals. Secondly, this anticipation of the bureaucrat's bias by the politician amplifies the inefficiencies in communication. Without bias, the bureaucrat switches from sending the signal *low* to the signal *high* at $m = \frac{1}{2}$. The biased bureaucrat switches at point $sp(b)$ given by

$$sp(b) \equiv \frac{x_l + x_h}{2} - b = \frac{1}{2} - 2b$$

, i.e. with rising bias, b, the threshold is skewed twofold. As we will see later, this is an important characteristic of the communication game with known types.

Figure 7 and 8 describe the equilibrium and the implied skewing of the message space graphically. Figure 7 shows the equilibrium outcomes of a game in which the bureaucrat has a bias of $b = 0$. The equilibrium actions of the politician are $x_l = \frac{1}{4}$, $x_h = \frac{3}{4}$ and the bureaucrat switches from sending the signal $n = low$ to $n = high$ at $m = \frac{1}{2}$.

This situation changes drastically if we introduce a positive bias $b > 0$. The equilibrium outcome is depicted in figure 8. While both actions x_l, x_h
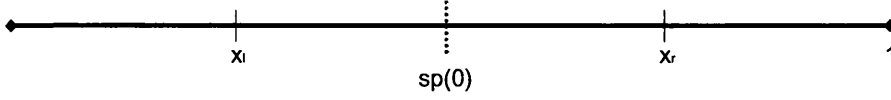
Figure 7: Equilibrium with no bias

shift to the left by b, the switching point, $sp(b)$, is now at $\frac{1}{2} - 2b$. Note, that part of this shift of $sp(b)$ is driven by the anticipation of the change of equilibrium actions. In other words: the *mistrust* of the politician amplifies the incentive to *exaggerate* for the bureaucrat. This spiral of mistrust and exaggeration is of crucial importance for welfare considerations.
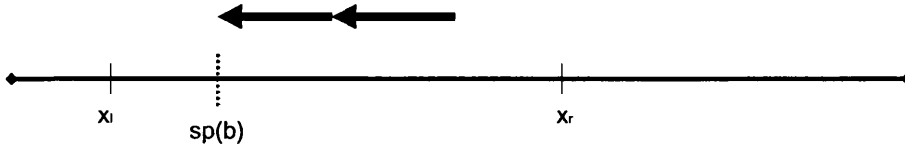
Figure 8: Equilibrium with positive bias

The skewing of the equilibrium actions and signalling to a significant loss of efficiency. This becomes clear if we look at the ex-ante expected utilities of the two actors. The politician's expected utility is

$$
\begin{aligned}
EU_{pol}^k &= -\int_0^{sp(b)} |m - x_l^*| pol - \int_{sp(b)}^1 |m - x_h^*| pol \\
&= -\left(\frac{1}{4} - b\right)^2 - \left(\frac{1}{4} + b\right)^2 \\
&= -\frac{1}{8} - 2b^2
\end{aligned}
$$

This is lower than the ex-ante utility without bias $EU_{pol}^k = -\frac{1}{8}$. Similarly,

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it can be shown that the expected utility of bureaucrat is

$$EU_{bur}^k = EU_R - 2b^2 = -\frac{1}{8} - 4b^2$$

which is strikingly low given the fact that the bureaucrat holds information. The reason is that the biased bureaucrat cannot *fool* the politician in equilibrium. Her position as a sender of information therefore only creates inefficiencies but gives her no influence on the final decision. A biased bureaucrat would therefore agree to be replaced by and unbiased bureaucrat because this lowers the inefficiencies in communication.

Large bias ($|b| \geq \frac{1}{4}$) If the ideological difference between politician and bureaucrat exceeds the threshold $|b| = \frac{1}{4}$, communication between the two does not convey any information because the conflict of interest is so large that every signal sent by the bureaucrat will be misinterpreted. In other words, $|b| > \frac{1}{4}$ implies that the bureaucrat only sends one of the two signals. A bureaucrat with $b = \frac{1}{2}$, for example, sends the signal $n = high$ for all m. Put differently, the signal loses its informational content. Knowing that this is the case, the politician will chose the action $x^* = \frac{1}{2}$ regardless of the signal sent.

This does not mean that for all $|b| > \frac{1}{4}$ the conflict of interest is too important to accommodate any possibility of communication. The reason for the breakdown of informative communication at a relatively low bias is the spiral of exaggeration by the bureaucrat and discounting by the politician. The next section discusses this in more detail.

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3.4 The Role of Commitment

Let us turn towards the question of commitment and how it could improve communication and ex ante utility. Crawford and Sobel (1982) stress that if the sender (bureaucrat) could commit to truth-telling, both players would benefit ex ante. In our version of CS, the actions $x_l = \frac{1}{4}$ and $x_h = \frac{3}{4}$ are the best response to truth-telling by the bureaucrat. What would happen if the politician could commit to these actions without of a commitment of the bureaucrat to tell the truth?

This commitment to be *naive* improves ex ante utility for the bureaucrat as she is now be able to manipulate the politician. In the case of low b, for example, the bureaucrat has an expected utility of $EU_S = -\frac{1}{8} - b^2$ which is better than the outcome derived above.

More surprisingly perhaps, even the politician can profit from his commitment despite the fact that he is manipulated by the bureaucrat.

Proposition 13 *For $|b| \leq \frac{\sqrt{15}-2}{8}$ the politician has a higher ex-ante expected utility from committing to the actions $x_l = \frac{1}{4}$ and $x_h = \frac{3}{4}$ than from any equilibrium without commitment.*

Proof. We show in the appendix C.2 that for $|b| \leq \frac{1}{4}$ the politician receives $EU_{pol} = -\frac{1}{8} - b^2$. This is better than the outcome $EU_{pol} = -\frac{1}{8} - 2b^2$ without commitment. This advantage, however, shrinks as the conflict of interest grows and becomes a disadvantage at $\left|\tilde{b}\right| = \frac{\sqrt{15}-2}{8}$. ∎

To understand this result first re-examine the equilibrium without commitment from the previous section. The politician discounted the bureaucrat completely and thereby amplified the fact that more signals were sent towards one of the two actions only. This outcome is transformed if the

politician can commit to trust the bureaucrat. The bureaucrat now skews her message space less and if the conflict of interest is not too large, both individuals benefit ex ante. Formally, the point $sp(b)$, changed at the rate $2b$ without commitment and changes at the rate b with commitment.

Figure 9 displays a graphic representation if the situation with commitment. A comparison of figures 7, 8 and 9 reveals the trade-off the politician faces when deciding for or against a commitment to the actions $x_l = \frac{1}{4}$ and $x_h = \frac{3}{4}$. First note that he loses expected utility compared to figure 7 because the bureaucrat shifts his switching point, $sp(b)$, towards the left. However, he could be better of than in the situation depicted in figure 8 because this shift is relatively small.
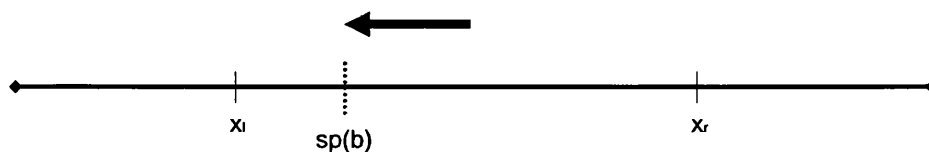
Figure 9: Outcome with commitment

What is the significance of the possible welfare improvement through commitment? We show in the following section that the absence of information regarding the type of the bureaucrat implies some degree of commitment for the politician.

3.5 Type Unobservable

In this section we assume that the politician does not observe the type of his bureaucrat. As before, a random bureaucrat is drawn from a symmetric (around zero) distribution $f(b)$ but only she knows her type. We believe that this assumption can reflect reality in bureaucracies where a large number

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of civil servants advise the minister (or politically appointed senior civil servants) on policies dealt with by their department. Since the politician faces a distribution of types, he no longer discounts the signal sent by the bureaucrat according to her bias anymore. Instead, the informational setting commits the politician to treating the bureaucrat as an (updated) average.

In order to make the intuition clear, it is useful to think of the somewhat artificial case of a distribution of types that has (almost) its entire mass at $b = 0$. This distribution acts like a commitment device to the actions $x_l = \frac{1}{4}$ and $x_h = \frac{3}{4}$ because it makes the politician believe he is advised by his own type. This commitment even works if the politician is advised by one of the rare bureaucrats with $|b| > 0$ but only as long as her type is not observed. Following the discussion in the previous section, both actors therefore profit (for $|b|$ not too high) from an arrangement in which the politician is not able to observe the bureaucrat's political views.

We start to show this formally by introducing the equilibrium outcome of the modified game. We then prove that given these equilibrium outcomes there are some $|b| > 0$ in some $f(b)$ for which the politician prefers to have no information on the bureaucrat's type. This can imply that the politician prefers to hold no information on the type of his bureaucrat.

3.5.1 Equilibrium Strategies

Proposition 14 *Denote the (cumulative) density function of bureaucrat types by $(F(b))$ $f(b)$ and assume that $f(b)$ is symmetric around 0. Define*

$$A \equiv \frac{F(\frac{1}{2})}{2} - \int_{-0.5}^{0.5} f(b)b^2 db$$

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In a communication game with no information on bureaucrat type, equilibrium actions of the politician are

$$x_l = \frac{3}{4} - A$$

and

$$x_h = \frac{1}{4} + A$$

The bureaucrat sends a signal $n = low$ for all $m \in [0, \frac{1}{2} - b]$ and $n = high$ otherwise.

Proof. For a proof of the proposition see the appendix C.3. ■

First note that equilibrium actions in this case are symmetric around $\frac{1}{2}$. For values of A close to $\frac{1}{2}$ these equilibrium actions represent a commitment to *trust* the bureaucrat. We have shown in the previous section that this commitment can be beneficial for the politician if $|b|$ is relatively small. The reason is that bureaucrats now switch from sending the signal $n = low$ to $n = high$ at $m = \frac{1}{2} - b$ and not $m = \frac{1}{2} - 2b$. This reduced skewing of the message space improves information transmission.

The term A describes the influence of Bayesian updating on the actions of the politician. If all types have values of b close to 0, $\frac{F(\frac{1}{2})}{2} = \frac{1}{2}$ and the term $\int_{-0.5}^{0.5} f(b)b^2 db$ is close to 0. Overall, A is then close to $\frac{1}{2}$ and the politician trusts his bureaucrats because he knows that their interests are similar.

For every bureaucrat type $|b| > \frac{1}{2}$, however, $F(\frac{1}{2})$ decreases (recall that we assumed symmetric $f(b)$) and equilibrium actions move towards the value $\frac{1}{2}$. The intuitive reason is that for $|b| > \frac{1}{2}$ bureaucrats send only one of the two signals regardless of m and the informational content of the average

signal received by the politician decreases. Note further that the maximum

of the term $\int_{-0.5}^{0.5} f(b)b^2 db$ is reached when half of the bureaucrats are of type

$b = \frac{1}{2}$ and the other half at $b = -\frac{1}{2}$.[85] It therefore never exceeds $\frac{1}{4}$. The

term reflects the Bayesian updating for types within the interval $\left[-\frac{1}{2}, \frac{1}{2}\right]$.

The more bureaucrats have values close to $b = \frac{1}{2}$ the more will they tend

towards sending only one signal. Again the politician reacts by moving

towards $\frac{1}{2}$ with his actions.

Taken together, this implies that $A \in \left[\frac{1}{4}, \frac{1}{2}\right]$. If the politician is only

advised by bureaucrats with $|b| \geq \frac{1}{2}$ there is never any meaningful message

and $A = \frac{1}{4}$. As soon as there are some bureaucrats with $|b| < \frac{1}{2}$ there is

some use to communication because $A > \frac{1}{4}$.

One feature of an equilibrium with $A > \frac{1}{4}$ is that the message the bu-

reaucrat sends, never fully reveals his type. This pooling character of the

equilibrium has important implications for our interpretation of proposition

14. In our application, this finding implies that given a pool of *moderate*

civil servants, the politician listens to each type of civil servants equally well.

3.5.2 Welfare Implications

Proposition 15 *Denote the density function of bureaucrat types by $f(b)$.*

For all symmetric $f(b)$ with $A > \frac{1}{4}$ there are some values of $|b| > 0$ for which

the politician would prefer not to know the type of the bureaucrat.

Proof. Given the analysis in section 3.4, we can focus on the case in which

the equilibrium actions under unknown types are close to $\frac{1}{2}$. Denote the

equilibrium actions by $x_l = \frac{1}{2} - \varepsilon$ and $x_h = \frac{1}{2} + \varepsilon$ where $\varepsilon > 0$ by assumption.

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[85] Note the similarities to the variance of b.

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It remains to be shown that for some value of b the politician receives a higher expected utility from not knowing b's type than from knowing it. Existence is most easily shown for $b > \frac{1}{4}$. Note that in this case there is no meaningful communication between bureaucrat and politician if the latter knows the type of his bureaucrat. His expected utility is therefore $EU_{pol}^k = -\frac{1}{4}$. Expected utility in the unknown type case is

$$EU_{pol}^u = -\left[x_h^2 - (x_h - x_l)sp(b) + \frac{1}{2} - x_h\right]$$

replacing $sp(b) = \frac{1}{2} - b$ we can rewrite the condition

$$-\left[x_h^2 - (x_h - x_l)(\frac{1}{2} - b) + \frac{1}{2} - x_h\right] > -\frac{1}{4}$$

Substituting x_l and x_h and simplifying we get

$$b < \frac{(1 - \varepsilon)\varepsilon}{2}.$$

As $\varepsilon > 0$ this condition is always satisfied for some (small) b. $\blacksquare$

The proposition shows that for a relatively general distribution of bureaucrat types there are some civil servants that should not reveal their type to the elected official when advising him on policy x. Of course, this statement alone is still relatively weak because it does not give any information on whether the politician would like to be generally informed about his bureaucrats or not.

However, it can be shown that for many reasonable distributions, $f(b)$, the politician prefers to stay ignorant regarding the type of his bureaucrat rather than knowing her type. This becomes clear if we look at figure 10. It depicts the ex ante utility of a politician from bureaucrats with types $b > 0$

and given a distribution $f(b)$ which leads to $A = 0.4$.[86]

We can roughly distinguish three intervals. For bureaucrats with small b, the politician prefers to know the type of his bureaucrat. The reason is that knowing the type of the bureaucrat is actually good for communication if b is small - treating her advice as coming from an updated average is doing her injustice.
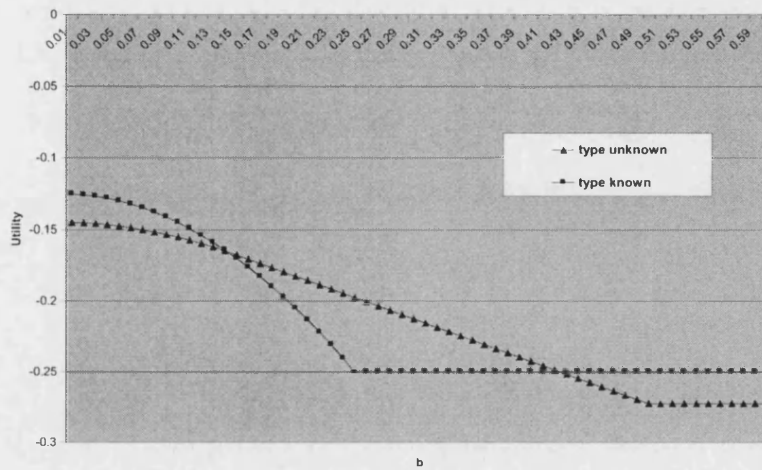

Figure 10: Ex ante expected utility of the politician advised by a bureaucrat of type b ($A = 0.4$)

This changes if the bureaucrat is of a type with a higher b. Knowing the type of the bureaucrat in such a situation is a disadvantage because communication is heavily distorted and becomes meaningless at $b = \frac{1}{4}$. The advantage of not knowing a moderate bureaucrat's type lies in the fact that she skews her signals less ($sp(b) = \frac{1}{2} - b$ compared to $sp(b) = \frac{1}{2} - 2b$) and therefore provides the politician with a higher expected payoff. If it is sufficiently likely that the bureaucrat comes from this interval, the politician

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[86] Note that the symmetric picture could be drawn for $b < 0$.

prefers not to know her type.

It can be shown, for example, that $A = 0.4$ can be created by a distribution of bureaucrats in which half have $b = -0.32$ and the other half has $b = 0.32$. As can be seen in figure 10, this bias places all of the bureaucrats in the interval in which the politician has a higher utility from not knowing the type of his bureaucrat. The politician therefore welcomes institutions that keep his bureaucrat's type a secret.

Finally, for large b, the ignorance of the politician makes him the victim of manipulation bureaucrat - the politician would prefer to know the type of these sort of bureaucrats as he should not listen to them. At $b = \frac{1}{2}$ communication becomes meaningless because an bureaucrat with that type would sends the signal $n = high$ for all m.

While it is not at the focus of this article, it should be noted that ex ante utility of the bureaucrat follows a similar pattern. A bureaucrat with small b prefers to make her type known to the politician while a bureaucrat with intermediate bias prefers to keep her type a secret. However, for a bureaucrat with even larger bias, this preference is not reversed. As long as the politician follows equilibrium actions $x_l \neq x_h$ bureaucrats with a large absolute bias will always strictly prefer to keep their type hidden.

If signalling types is easy, this implies an interesting time-inconsistency problem for bureaucrat and politician. To see this, assume that once a bureaucrat is picked, she has the opportunity to signal the politician her type. We know that all types within a small range around $b = 0$ will always want to do so. This, however, changes the conditional beliefs of the politician if the type is not revealed. He will adjust his actions by moving them towards $\frac{1}{2}$ which means that more bureaucrat types would want to reveal their type to him. The signalling opportunity hereby destroys the

equilibrium in proposition 15 and can even lead to a complete revelation for some $f(b)$. Even if the politician and a majority of bureaucrats ex ante prefer to keep types hidden.

3.5.3   An Example

Returning to the politician we have argued that for type distributions with enough mass of bureaucrats with values of b close to 0, the politician ex ante prefers to face an unknown type to a known type. In what follows, we discuss an example to explain this important implication of proposition 15.

Assume that types b are uniformly distributed between $\left[-\frac{1}{2}, \frac{1}{2}\right]$. Given this restriction of the support we have that $F(\frac{1}{2}) = 1$ and $f(b) = 1$ for all b. Using the definition of A we can calculate $A = \frac{5}{12}$. Following proposition 14, the actions with unknown type are then $x_l = \frac{1}{3}$ and $x_h = \frac{2}{3}$. In order to evaluate the ex-ante utility from the uniform distribution of bureaucrats, we have to first evaluate the ex-ante utility for all values of b. Denote $E\left(U_{pol}^k \mid b\right)$ the ex-ante expected utility for the politician from a known type b. In figure 10, we can clearly observe that utility has a kink at the point where communication breaks down. Formally,

$$E\left(U_{pol}^k \mid b\right) = \begin{cases} -\frac{1}{8} - 2b^2 & \textit{if} \quad |b| < \frac{1}{4} \\ -\frac{1}{4} & \textit{if} \quad |b| \geq \frac{1}{4} \end{cases}$$

Denote the ex-ante expected utility from an unknown bureaucrat b by $EU_{pol}^u \mid b$. Given the actions $x_l = \frac{1}{3}$ and $x_h = \frac{2}{3}$ we have three intervals of the expected utility function

$$E\left(U_{pol}^u \mid b\right) = \begin{cases} -\frac{5}{36} - b^2 & if & |b| < \frac{1}{6} \\ -\frac{1}{9} - \frac{1}{3}|b| & if & \frac{1}{6} \le |b| < \frac{1}{2} \\ -\frac{5}{9} & if & \frac{1}{2} \le |b| \end{cases}$$

where we present the last interval just for matching our formal description to figure 10. Given the support of the example, $\left[-\frac{1}{2}, \frac{1}{2}\right]$, we do not require it. Again, the kink in figure 10 matches the point $|b| = \frac{1}{2}$. A bureaucrat with a larger bias (in absolute terms) sends only one signal.

Note first that $-\frac{5}{9} < -\frac{1}{4}$ and $-\frac{5}{36} < -\frac{1}{8}$. This implies that for values of b close to $\frac{1}{2}$ and close to 0, the politician would ex-ante prefer to know the type of his bureaucrat. However, for a range of intermediate types, $|b| \in [0.12, 0.41]$, the politician prefers to not know who advises him.

Given the two functions it can be shown that the politician prefers not to know the type of a random draw from the uniform on $\left[-\frac{1}{2}, \frac{1}{2}\right]$. To see this, note that the overall expected utility from facing a uniform distribution on $\left[-\frac{1}{2}, \frac{1}{2}\right]$ and knowing the type is

$$EU_{pol}^k = -2\left[\int_0^{\frac{1}{4}} \frac{1}{8} + 2b^2 db + \frac{1}{16}\right] = -\frac{10}{48}$$

and from not knowing the type

$$EU_{pol}^u = -2\left[\int_0^{\frac{1}{6}} \frac{5}{36} + b^2 db + \int_{\frac{1}{6}}^{\frac{1}{2}} \frac{1}{9} + \frac{1}{3}b db\right] = -\frac{14}{81}$$

so that clearly

$$EU_{pol}^u > EU_{pol}^k.$$

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3.6 Conclusion

In this article we model communication between a politician and a civil servant and evaluate the welfare outcomes with known and unknown bureaucrat types. We show that not knowing the political views of a bureaucrat can be beneficial to the politician. The reason for this advantage is that the politician assumes the civil servant to be an *average* civil servant. This belief of the politician can be viewed as a commitment to trust the bureaucrat. Communication improves because this treatment of the civil servant diminishes her incentives to distort her advice. While this effect is not dominant for all types of civil servants it can be the decisive factor in an ex-ante perspective.

The formal proof of our result relies heavily on the assumption of symmetric distributions of bureaucrat types. However, it can be shown that, even in our simplified model, very similar results hold for asymmetric distributions. The specific values of equilibrium actions and welfare have to be approximated in that setting, though. We believe that this justifies the symmetry assumption that is rather unique for our study.

Two other options of dealing with the inefficiency of communication are important in the context of bureaucracies. First, according to Dessein (2002) the allocation of a decision right to the bureaucrat might improve welfare for the politician. Such an allocation of authority has the additional advantage of making the action infinitely precise. However, when we compare the solution proposed in this article with the allocation of a decision right it becomes clear that there is no clear dominance between them. The advantage of secrecy is that it can make communication possible between a politician and strongly biased bureaucrats while the allocation of authority

fails to connect politician and bureaucrat in this case.[87] *Political neutrality* is most useful if a moderate politician has to be connected with expertise contained in a bureaucracy of a wide range of political views.

Secondly, letting the politician choose his advisor is clearly dominating. Not only is this setting preferred by the politician but it can actually be preferred by a large share of biased bureaucrats as well. And indeed, the appointment of bureaucrats by politicians, usually along party lines, is a practice that remains common even after the introduction of a career civil service.

However, we show in chapter 1 that this practice of *patronage* might go hand in hand with a loss of competence because recruitment along political lines prevents recruitment of the most competent candidate.[88] Assuming recruitment and promotion by merit, the politician looses control over his subordinates. We have shown here that if the politician faces an exogenously given distribution of bureaucrats, less information on their political views can be beneficial. Hence, political neutrality as a norm could be the attempt to improve the flow of information between a politically heterogeneous bureaucracy recruited by merit and the political leadership.

This reveals a complementarity between the commitment towards the merit principle and the norm of political neutrality. On the one hand, recruitment by merit makes neutrality a second-best solution to the communication problem. On the other hand, political neutrality requires that the politician is not involved in the recruitment procedures which is exactly

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[87]Note, for example, that in the case of $A = 0.4$ discussed above, the politician gains from communicating with bureaucrats of type $|b| = 0.32$; something that is impossible in Dessein's soluation because the decision right is not allocated to the bureaucrat in this case.

[88]See Ingraham (1987) for an account of this loss within the United States executive under Reagan.

what recruitment by merit requires, too. It is therefore no wonder that recruitment and promotion in the career civil service are designed to reduce political involvement in the process[89] while the recruited bureaucrats are at the same time discouraged to make their political opinion public.[90]

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[89] This typically includes the use of state examinations and the reduction of places filled through political appointment or recommendation. The US Pendleton Act of 1883, for example, stresses that no recommendation letters are to be handed in for an applicant to the civil service.

[90] For an early discussion in the United Kingdom see Clark (1959).

Conclusion

In this concluding chapter, I will summarize and critically reflect on the main results of each chapter.

The first chapter conceptualizes two sets of bureaucratic institutions, patronage and meritocracy, as different mechanisms of recruitment and promotion of bureaucrats. I show that patronage guarantees politically homogenous governments in situations where political loyalty is important. However, meritocratic recruitment and promotion can be interpreted as a commitment to ignore loyalty considerations. This commitment can increase competence in comparison to patronage by channeling political competition into the bureaucracy.

The main aim of the first chapter is to explain how the distribution of political power within a state affects the choice between meritocracy and patronage. I argue that a more equal distribution of political power will typically increase the attractiveness of meritocracy. This is even where a share of the population is more motivated to support the government under patronage. The reason is that the group in power can only gain support through patronage as long as it controls recruitment in the future. If the two groups competing for the seat in government are equally powerful, patronage only increases the stakes without giving one group an advantage over the other.

One of the important limitations of the model introduced in the first chapter is that it is based entirely on the political motivation of the bureaucrat. Bureaucrats will follow an exogenously given preference when shaping policy and investing into competence. The finding that meritocracy leads to competence is partially driven by this policy motivation. This shifts the at-

tention away from wage payments, which are central element in most other models. In a simple model with two candidates, wage payments strengthen meritocracy because of their larger impact on competence. However, this effect depends strongly on the number of candidates competing for the wage price and requires an additional set of assumptions and has thus not been included.

On a more general level, it must be acknowledged that it remains unclear to what extent actions by bureaucrats are led by exogenously given taste parameters. Yet, it is not unrealistic to assume that bureaucrats have their own political preferences or identify themselves with specific interest groups in society. In this regard, it is important to note that the model only assumes that this influences their actions in the absence of objective information.[91] But if one assumed that bureaucrats are mainly career-driven, a considerable part of the model would become endogenous.

Another potential problem of the model is that it conceptually separates patronage and meritocracy without considering a mixed system option. For example, there could be a meritocratic pre-selection followed by a selection by the politician. This idea leads back to a discussion of assumption A1 in the first chapter; is it possible that two individuals have exactly the same level of competence? If the answer is in the negative, then there will always be a slight loss of competence connected to the use of patronage. Nonetheless, the welfare losses connected to a mixed system would then be minimized.

The findings presented in the first chapter have several implications for

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[91] To the author's surprise, this notion found some support in a conversation with a junior civil servant from Her Majesty's Revenue and Customs - despite the strong norm of political neutrality in the United Kingdom civil service.

future research. One possibility is to test the model empirically by using the data gathered by the Political Risk Services group. The group surveys experts on a large group of countries and across time on the *degree to which bureaucracy tends to be somewhat autonomous from political pressure and has an established mechanism for recruitment and training.* This seems sufficiently related to the notion of meritocracy to make the data interesting for a more thorough cross-country analysis. Another possibility for further research is to apply this model to the study of military organizations since they reflect a particularly stark conflict between competence and loyalty to the government of a country.

The second chapter builds a moral hazard in teams model in order to evaluate the validity of a widespread argument for not-for-profit dominance. The owner of a firm hires a worker who is keen to participate in the production of a special output (health, poverty reduction, etc.) and receives a non-pecuniary benefit when production is successful. However, this intrinsic motivation of the worker can only be translated into wage reductions if the worker is *left alone* in the process. In other words, where the worker feels that output would be provided regardless of his efforts, he will require a higher financial incentive to exert effort. On the other side, where the owner of the firm can commit not to interfere with production, the worker knows that output will fully reflect his actions and will thus be more intrinsically motivated. Not-for-profit firms therefore achieve the same level of effort with lower incentive pay.

In this paper, we show that in order for the not-for-profit to dominate, it needs to provide commitment for the manager not to exert effort. If the commitment problem is either not important or impossible to solve, the for-profit is the optimal choice.

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Focusing on the case where the for-profit manager cannot commit, we find that the not-for-profit set-up is chosen by the manager under the condition that he is not very motivated. Namely, both financial and intrinsic benefits reduce the chance that managers will choose the not-for-profit. The reason for this is that the not-for-profit set-up provides low wage costs by using worker's intrinsic motivation effectively, but does so on account of efficiency and financial returns.

We also show that if workers can choose freely whether they want to work in a for-profit or a not-for-profit firm they will always choose a for-profit. The reason for this is that workers earn lower wages and receive lower expected intrinsic benefits (since the manager does not supply effort) in the not-for-profit. In order to attract workers, the not-for-profits would have to pay a higher wage and would thereby loose their attractiveness as an organizational form for the manager. We claim that with endogenous matching, not-for-profits do not emerge where motivated workers are relatively scarce. To put it differently, oversupply of intrinsically motivated labour is a necessary condition for the survival of not-for-profit firms.

This last result suggests a rather pessimistic view on the link between not-for-profits and intrinsic motivation. Not-for-profits do not emerge because motivated workers *like* to work in that organizational environment, but because there is a surplus of motivated labour in these sectors. While the for-profit is the institutional set-up that achieves the first best, it is not chosen by unmotivated managers who have market power.

The provision of full financial incentives to the manager is often assumed to be associated with certain social costs. Yet, as we show in our model, the *contractual failure* is an internal one between manager and worker. This implies that the not-for-profit is not the solution to a conflict between the

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goals of the organization and society, but between manager and worker.

The analysis in the second chapter thus proposes an alternative way of modelling the link between intrinsic motivation and not-for-profit firms. One could assume that intrinsic motivation of both worker and manager are linked to the consumer surplus that results from the provision of output. Even if we drop the double moral-hazard structure, this assumption regarding intrinsic motivation could still justify the use of not-for-profit firms. In such a model, not-for-profit firms would be used to commit to low-price provision and would therefore attract motivated managers and workers. This could provide a theory of not-for-profit firms based on intrinsic motivation that would entail endogenous matching and output market competition.

The third chapter develops a theory of political neutrality in the context of a permanent civil service. This theory builds on the analysis of a simple cheap talk game which models communication between an elected official and a civil servant and evaluates the welfare outcomes with known and unknown types. I show that ignorance about the political views of a civil servant can be beneficial to the elected official. This advantage is a result of the politician's assumption that the bureaucrat expresses *average* views. This assumption can improve communication because it reduces the bureaucrat's incentives to distort her advice. While this effect is not dominant for all types of bureaucrats, it can be the decisive factor in an ex-ante perspective.

Admittedly, the link between a permanent civil service and political neutrality might be a much simpler one. For example, permanent employment might motivate bureaucrats to remain neutral in order to advance their career regardless of the changes of government. It is likely that this career motivated incentive for moderation is important in meritocratic insti-

tutions. The change in dynamic incentive is then similar to a change in political preference since the bureaucrat actually behaves in line with the policy preference of each incoming government.

This thesis presents three models of intrinsic motivation and conflict in organizations. While they were developed with specific applications in mind, organizations involved in the provision of heterogenous public goods (parties, international organizations, etc.) are likely affected by similar concerns. Therefore, these models can serve as a useful platform on which to build further empirical and theoretical research.

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A   Appendix for Secion 1

A.1   Proof of Lemma 4

Note first that the game is symmetric in payoffs. We can therefore summarize payoffs in the merit system in the following table

left\right	invest	not invest
invest	A, A	B, C
not invest	C, B	D, D

Where the respective payoffs are

$$A = \frac{1}{2}\left[\frac{1}{2}e_h(\pi + \tau) + \frac{1}{2}\pi\right] + \frac{1}{2}\left[\frac{1}{2}(\pi + \tau) + \frac{1}{2}\left(e_h\pi + (1 - e_h)\tau\right)\right] - c$$

$$B = \frac{1}{2}(\pi + \tau) + \frac{1}{2}\left(e_h\pi + (1 - e_h)\tau\right) - c$$

$$C = \frac{1}{2}e_h(\pi + \tau) + \frac{1}{2}\pi$$

$$D = \frac{1}{2}\left[\frac{1}{2}e_l(\pi + \tau) + \frac{1}{2}\pi\right] + \frac{1}{2}\left[\frac{1}{2}(\pi + \tau) + \frac{1}{2}\left(e_l\pi + (1 - e_l)\tau\right)\right]$$

If candidates play a mixed strategy, the probability of investment for each of them is

$$\Pr(invest) = \frac{B - D}{B - D + C - A}$$

or

$$\Pr(invest) = \frac{\frac{1}{2}\left[(e_h - e_l)\pi + (1 - e_h)\tau\right] - c}{\frac{1}{2}(e_h - e_l)\pi}$$

While if $c \leq \frac{1}{2}(1 - e_h)\tau$ we have $\Pr(invest) = 1$ and if $c > \frac{1}{2}\left[(e_h - e_l)\pi + (1 - e_h)\tau\right]$

we have $\Pr(invest) = 0$. Lemma 4 follows immediately.

A.2 Proof of Lemma 5

Denote the investment level of the right candidate by e_1 and the investment by the left candidate by e_0. We can then write the expected utility of the left incumbent as

$$
\begin{aligned}
U_{patr} &= \lambda \left[\frac{1}{2}(\pi + \tau) + \frac{1}{2}\left(e_0 \pi + (1 - e_0)\tau\right) \right] \\
&\quad + (1 - \lambda) \left[\frac{1}{2}e_1(\pi + \tau) + \frac{1}{2}\pi \right]
\end{aligned}
$$

we therefore have that

$$
\begin{aligned}
\frac{\delta U_{patr}}{\delta \lambda} &= \frac{1}{2}(\pi + \tau) + \frac{1}{2}\left(e_0 \pi + (1 - e_0)\tau\right) \\
&\quad - \left[\frac{1}{2}e_1(\pi + \tau) + \frac{1}{2}\pi \right]
\end{aligned}
$$

which is simply the expected utility from a left bureaucrat minus the expected utility from a right bureaucrat. By $A1$ this is positive even if $e_1 > e_0$ and we therefore have

$$
\frac{\delta U_{patr}}{\delta \lambda} > 0
$$

A.3 Proof of Proposition 2

First note that if both bureaucratic systems imply the same level of investment for the left and right candidate, meritocracy is preferred if and only if $p \leq \frac{1}{2}$. This follows immediately from the fact that the left candidate is hired with probability $\frac{1}{2}$ under meritocracy and with probability p under

patronage. It remains to be shown that at $p = \frac{1}{2}$ competence is at least as high under meritocracy for all values of c and strictly higher for some.

If $\lambda = \frac{1}{2}$ competence under patronage is e_h with certainty for all $c <$ $\frac{1}{4}(e_h - e_l)(\pi - \tau)$ and e_l otherwise. By $A1$ we have that

$$\frac{1}{2}(1 - e_h)\tau > \frac{1}{4}(e_h - e_l)(\pi - \tau)$$

which implies that meritocracy leads to full competence ($z = 1$) for all values of c at which patronage offers $e = e_h$. Meritocracy therefore leads to a strictly higher expected utility to the left incumbent if

$$c \in \left(\frac{1}{4}(e_h - e_l)(\pi - \tau), \frac{1}{2}(e_h - e_l)\pi + \frac{1}{2}(1 - e_h)\tau\right)$$

For higher values of c, investment into competence is low under both bureaucratic systems and the incumbent is indifferent between patronage and meritocracy at $\lambda = \frac{1}{2}$.

A.4   Low polarization - Violation of A1

If $A1$ is violated, recruitment under meritocracy is not affected while patronage now recruits the agent with more investment and if both agents invested, the politician recruits the candidate that matches the type of the politician. Similarly to the investment under meritocracy we can derive that if candidates play a mixed strategy, the probability of investment for the left candidate is

$$x = \frac{p(1 - e_l)\tau + \frac{1}{2}(e_h - e_l)(\pi - \tau) - c}{\left(p - \frac{1}{2}\right)(1 - e_h)\tau + \frac{1}{2}(e_h - e_l)\pi + \left(p - \frac{1}{2}\right)(1 - e_l)\tau}$$

and investment by the right candidate is

$$y = \frac{(1-p)(1-e_l)\tau + \frac{1}{2}(e_h - e_l)(\pi - \tau) - c}{\left(\frac{1}{2} - p\right)(1 - e_h)\tau + \frac{1}{2}(e_h - e_l)\pi + \left(\frac{1}{2} - p\right)(e_h - e_l)\tau}$$

comparing this to the probability under meritocracy

$$z = \frac{\frac{1}{2}\left[(e_h - e_l)\pi + (1 - e_h)\tau\right] - c}{\frac{1}{2}(e_h - e_l)\pi}$$

we see that they are identical under $\lambda = p = \frac{1}{2}$. Both bureaucratic systems lead to identical investment regardless of the level of c. Since $p = \frac{1}{2}$ the likelihood of recruitment for each candidate is also identical under meritocracy and patronage and therefore the expected utility for the left incumbent is the same.

A comparison of the remaining parameter space is complicated by the fact that the mixed strategy equilibrium is not symmetric under patronage. While a rise in p from $p = \frac{1}{2}$ will increase the recruitment power it is not clear what happens to competence. It can be shown, however that for most levels of c, competence under patronage is sufficiently high to prevent any dominance of meritocracy for all $\lambda \geq \frac{1}{2}$.

To start the analysis it first helps to look at the comparison of pure strategy equilibria. If $\frac{1}{2}(1 - e_h)\tau \leq c$ both candidates always invest under meritocracy. Under patronage, they both invest at $\lambda = \frac{1}{2}$. At $\lambda > \frac{1}{2}$ there are two possibilities. Either only the left candidate invests, in which case he is always hired, or both candidates invest which means that the left candidate is hired with $\lambda > \frac{1}{2}$.

To see this analyze the pure strategy options. Assume there is a pure strategy equilibrium in which only the left candidate invests. Under a pure

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strategy equilibrium the left invests (given that right does not invest) if

$$\frac{1}{2}(\pi + \tau) + \frac{1}{2}(e_h \pi + (1 - e_h)\tau) - c$$
$$\geq p \left[\frac{1}{2}(\pi + \tau) + \frac{1}{2}(e_l \pi + (1 - e_l)\tau)\right] + (1 - p)\left[\frac{1}{2}e_l(\pi + \tau) + \frac{1}{2}\pi\right]$$

or

$$(1 - p)(1 - e_l)\tau + \frac{1}{2}(e_h - e_l)(\pi - \tau) \geq c$$

which holds because $\frac{1}{2}(e_h - e_l)(\pi - \tau) \geq (1 - e_h)\tau > c$.

The right candidate does not invest (given that the left candidate invests) if

$$\frac{1}{2}e_h(\pi + \tau) + \frac{1}{2}\pi$$
$$\geq p\left[\frac{1}{2}e_h(\pi + \tau) + \frac{1}{2}\pi\right] + (1 - p)\left[\frac{1}{2}(\pi + \tau) + \frac{1}{2}(e_h \pi + (1 - e_h)\tau)\right] - c$$

or

$$c \geq (1 - p)(1 - e_h)$$

which might hold or not hold for a given combination of $\frac{1}{2}(1 - e_h)\tau \leq c$ and $p > \frac{1}{2}$. The important point is, however, that there is no equilibrium in which only the right candidate invests. Because, given right investment, the left candidate still invests if

$$p(1 - e_h)\tau \geq c$$

which holds for all $\frac{1}{2}(1 - e_h)\tau \leq c$ and $p > \frac{1}{2}$ and, hence, the left candidate has a dominant strategy to invest.

From this analysis we can also see that the condition $max\,\{p, 1-p\}\,(1 - e_h)\tau \geq c$ is sufficient for a pure strategy equilibria under patronage in which at least one candidate is always investing into competence.

But what about other levels of c? Levels of c without investment are easy to analyze - again only control matters and patronage is chosen for $\lambda > \frac{1}{2}$. It should be stressed in this context that patronage leads to investment for higher c than meritocracy. This can be seen through a comparison of x, y and z.

Furthermore, one can show that for all

$$c \in \left[\frac{1}{4}\left(e_h - e_l\right)\pi + \frac{1}{2}\left(1 - e_h\right)\tau, \frac{1}{2}\left[(e_h - e_l)\pi + (1 - e_h)\tau)\right]\right]$$

patronage is chosen for all $\lambda > \frac{1}{2}$ and not chosen for all $\lambda < \frac{1}{2}$ as long as λ close to $\frac{1}{2}$. The proof is available from the author upon request.

Numerical analysis of the remaining space confirms the impression gained by that the analysis of the pure strategy equilibria and the mixed strategy equilibria for this particular set of parameters - patronage under the violation of $A1$ is (weakly) preferred if and only if $\lambda \geq \frac{1}{2}$.

A.5 Proof of Proposition 3

If we review the investment decisions we get that under meritocracy competence is high with probability

$$\Pr(competent \mid merit) = \begin{cases} 1 & if \quad c \leq \frac{1}{2}\left(1 - e_h\right)\tau \\ 1 - (1 - z)^2 & if \quad c > \frac{1}{2}\left(1 - e_h\right)\tau \end{cases}$$

where

$$z \equiv \max \left\{ 1 - \frac{c - \frac{1}{2}\left(1 - e_h\right)\tau}{\frac{1}{2}(e_h - e_l)\pi}, 0 \right\}$$

And under patronage

$$\Pr(competent \mid patr) = \begin{cases} 1 & if \quad A \geq c \cap B \geq c \\ \lambda & if \quad A \geq c \cap B < c \\ (1 - \lambda) & if \quad A < c \cap B \geq c \\ 0 & if \quad A < c \cap B < c \end{cases}$$

because the left candidate invests if

$$A \equiv p\frac{1}{2}\left(\pi - \tau\right)\left(e_h - e_l\right) \geq c$$

and the right candidate invests if

$$B \equiv (1 - p)\frac{1}{2}\left(\pi - \tau\right)\left(e_h - e_l\right) \geq c.$$

Meritocracy therefore dominates for investment costs that rule out investment under patronage but have $z > 0$, that is for values

$$\frac{1}{2}\left[(e_h - e_l)\pi + (1 - e_h)\tau\right] > c > \frac{1}{2}\left(\pi - \tau\right)\left(e_h - e_l\right)$$

similarly, meritocracy also (weakly) dominates for low values of c in which we have investment with certainty

$$c \leq \frac{1}{2}\left(1 - e_h\right)\tau$$

The crucial question is then whether

$$(\pi - \tau)(e_h - e_l) > (1 - e_h)\tau$$

or not. If the condition is fulfilled, the intrinsic motivation of a candidate in a power monopoly is higher than the motivation from political conflict. There is then an area in which investment under meritocracy is incomplete $z < 1$ but investment under patronage is high for very extreme values of λ (because $\Pr(competent \mid patr)$ can only be high for these values). We describe these values of power distribution as high concentrations of power because they have to be either close to 0 or 1.

Formally the area of patronage dominance is therefore given by the condition

$$\Pr(competent \mid patr) > 1 - (1 - z)^2$$

and

$$(\pi - \tau)(e_h - e_l) \geq c > (1 - e_h)\tau$$

If the second condition cannot be satisfied, the two areas of (weak) meritocracy dominance overlap and patronage never does. Note that $A1$ allows for both possibilities.

A.6 Proof of Proposition 4

Expected utility of the incumbent under $S_1 = merit$ is

$$U_{merit} \quad = \quad \left[1-(1-z)^2\right]\left[\frac{1}{2}\left[\frac{1}{2}e_h(\pi+\tau)+\frac{1}{2}\pi\right]+\frac{1}{2}\left[\frac{1}{2}(\pi+\tau)+\frac{1}{2}(e_h\pi+(1-e_h)\tau)\right]\right]$$

$$+(1-z)^2\left[\frac{1}{2}\left[\frac{1}{2}e_l(\pi+\tau)+\frac{1}{2}\pi\right]+\frac{1}{2}\left[\frac{1}{2}(\pi+\tau)+\frac{1}{2}(e_l\pi+(1-e_l)\tau)\right]\right]$$

$$+\frac{1-(1-2\lambda)(1-\alpha)}{2}R$$

where z is the investment likelihood under meritocracy. The expected utility under $S_1 = patr$ is

$$U_{patr} \quad = \quad \lambda\left[\frac{1}{2}(\pi+\tau)+\frac{1}{2}(e_0\pi+(1-e_0)\tau)\right]$$

$$+(1-\lambda)\left[\frac{1}{2}e_1(\pi+\tau)+\frac{1}{2}\pi\right]+\lambda R$$

where e_0 and e_1 are the left and right investment level respectively.

Now assume $\lambda = 1$ and $c > \frac{1}{2}(\pi-\tau)(e_h-e_l)$. We have that $U_{patr} > U_{merit}$ if

$$\left[1-(1-z)^2\right]\left[\frac{1}{2}\left[\frac{1}{2}e_h(\pi+\tau)+\frac{1}{2}\pi\right]+\frac{1}{2}\left[\frac{1}{2}(\pi+\tau)+\frac{1}{2}(e_h\pi+(1-e_h)\tau)\right]\right]$$

$$+(1-z)^2\left[\frac{1}{2}\left[\frac{1}{2}e_l(\pi+\tau)+\frac{1}{2}\pi\right]+\frac{1}{2}\left[\frac{1}{2}(\pi+\tau)+\frac{1}{2}(e_l\pi+(1-e_l)\tau)\right]\right]$$

$$+\frac{1+(1-\alpha)}{2}R$$

$$< \quad \left[\frac{1}{2}(\pi+\tau)+\frac{1}{2}(e_l\pi+(1-e_l)\tau)\right]+R$$

or

$$\left[1-(1-z)^2\right](e_h-e_l)\pi < (1-e_l)\tau+\frac{1}{2}\alpha R$$

for $z = 1$ this yields the condition in the proposition. The proposition follows from the fact that z is falling in c. If the condition holds for $z = 1$ it will hold for all $z < 1$.

With $z = \left\{ 1 - \frac{c - \frac{1}{2}(1 - e_h)\tau}{\frac{1}{2}(e_h - e_l)\pi}, 0 \right\}$

$$\left[1 - \left(\frac{c - \frac{1}{2}\left(1 - e_h\right)\tau}{\frac{1}{2}(e_h - e_l)\pi} \right)^2 \right] \left(e_h - e_l\right)\pi < \left(1 - e_l\right)\tau + \frac{1}{2}\alpha R$$

which shows that π always benefits meritocracy.

B   Appendix for Section 2

B.1   Discussion of Contractual Assumptions

Assume first that wages can only be made contingent on the final success of the project but not on intermediate output. We then have $w_1 = w_2$. Given proposition 1 the potential advantage of the not-for-profit is that the manager can use the reduction of α to create commitment. The not-for-profit manager will then set w_{NP} such that the worker's IC constraint is binding and α^* such that he commits himself to no effort in case the worker does not succeed.

But if we examine equation 1, we can see that commitment can also be reached by setting a higher wage w_{FP}. Due to the fact that we assumed $w_1 = w_2$, the effect on first stage expected utility of the manager is identical to the effect of a reduction in α. In both cases the expected first stage utility is equal to the second stage expected utility.

$$h(\theta_M + \pi - w_{FP}) = h(\theta_M + \alpha^*(\pi - w_{NP})) = 1$$

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and the for-profit set-up can perfectly mimic the not-for-profit set-up. This rules out not-for-profit dominance.

This does not change under a more general setting where both final and intermediate output are contractible, i.e. $w_1 \neq w_2$. The only change to the scenario above is that the for-profit manager can now use the wage w_2 to commit to no effort and both managers can use the wage w_1 to make the worker IC bind. However, note that w_2 is a better instrument than α to reach commitment as it does not reduce the payoff in the first period. The wage on intermediate output will be used by both organizational forms in the same way. The not-for-profit can therefore never be better than the for-profit.

Given our proposition 1 we can focus on the case in which the manager tries to reach commitment to no effort and check whether the not-for-profit dominates. Observe that the binding IC constraint of the manager implies that the second stage expected payoff is independent of the way commitment is reached. The expected second stage payoff is always

$$h(\theta_M + \pi - w_{2,FP}) = h(\theta_M + \alpha^* (\pi - w_{2,NP})) = 1$$

where $w_{2,FP}$ and $w_{2,NP}$ refer to wages based on final output under for-profits and non-profits.

Therefore, all we have to compare is the first period expected utility of the manager. But because first and second stage wages can be set independently under this contracting regime, the for-profit wage will just be set such that the IC constraint is binding. The for profit wage is then given by

$$h(\theta_W + w_{1,FP}) = 1$$

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which implies that $w_{1,FP} = w_{1,NP}$. The only difference between for- and not-for-profit is therefore that the not-for-profit reaches commitment by reduction of α to $\alpha^* \leq 1$ as well as payment of a second-stage wage while the for-profit does it only through payment of a second-stage wage. The result is immediate.

If commitment is beneficial for the manager, providing it by paying a second stage wage is cheaper than reducing the profit share allocated to the manager. The reason is that the cost in second stage payoff is the same between the two ways of commitment. But reducing α also reduces retained profits while paying a second stage wage does not.

B.2 Alternative Not-for-profit Setting

Assume that the not-for-profit set up is captured by $\alpha = 0$. In that case, worker intrinsic motivation has no impact on manager welfare as he is indifferent between different wage regimes.

Now the manager's expected payoff under a not-for-profit is

$$h\theta_M.$$

The manager's payoff under a for-profit is

$$h(\pi - w + \theta_M) + (1 - h)\left\{h(\pi + \theta_M) - 1\right\}.$$

This implies that the not-for-profit dominates if

$$h\theta_M > h(\pi - w + \theta_M) + (1 - h)\left\{h(\pi + \theta_M) - 1\right\}$$

or

$$0 > h(\pi - w) + (1 - h)\{h(\pi + \theta_M) - 1\}.$$

Recall that we assumed that $\pi - w < 0$ cannot hold. By A1 we further have that $h(\pi + \theta_M) > 1$ and, hence, the condition can never hold.

B.3   Inclusion of Worker in For-profit

The two options for a wage in the for-profit firm are $w = 0$ and $w = w_{FP}$ - either, the manager ignores the worker or he pays her the minimum wage needed to make her exert effort. In order to show the optimality of w_{FP} we only have to prove that the manager would never want to ignore the worker and pay no wage. The manager prefers to pay no wage and just exert effort by himself if

$$h(\pi + \theta_M) - 1 > h(\pi - w_{FP} + \theta_M) + (1 - h)h(\pi + \theta_M) - 1$$

where the right hand side of this inequality is just a mix between the first stage outcome of worker effort, $\pi - w_{FP} + \theta_M$ and the second stage outcome of manager effort, $h(\pi + \theta_M) - 1$. The left hand side just features manager effort and so all the weight is on the second stage. The simple condition for the manger to prefer ignoring the worker is then

$$h(\pi + \theta_M) - 1 > \pi - w_{FP} + \theta_M$$

inserting the wage, w_{FP} from above we get that this condition is fulfilled if

$$h(\pi + \theta_M) - 1 > \frac{1}{h}[h(\pi + \theta_M) - 1] + (1 - h)\theta_W$$

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which is a clear contradiction given that by $A1 : h\left(\pi + \theta_M\right) - 1 \geq 0$.

C   Appendix for Section 3

C.1   Equilibrium with Known Types

Note first that given two actions x_h and x_l, the utility difference of sending a signal towards one or the other action is a weakly monotone, continuous function in b and will always be 0 for some value of b. Hence, the bureaucrat follows a strategy in which she switches from sending the signal $n = low$ to $n = high$ at some specific point $sp(b)$. In equilibrium, this point determines the beliefs of the politician on m. Given the uniform prior on m, conditional beliefs are

$$E(m \mid n = low) = \frac{1}{2}sp\left(b\right)$$

and

$$E(m \mid n = high) = \frac{1}{2}\left[1 - sp\left(b\right)\right]$$

Equilibrium messaging by the biased bureaucrat requires both actions to give her the same utility at $m = sp(b)$. With $x_l < sp(b){+}b$ and $x_h > sp(b){+}b$ we can describe this condition through the equation

$$sp(b) + b - x_l = x_h - sp(b) - b$$

and this can be rewritten to

$$sp(b) = \frac{x_l + x_h}{2} - b$$

This equation is equivalent to the no-arbitrage equation in CS. It implies that the point at which the sender switches will not be the average between the two equilibrium actions but is lower for $b > 0$. The receiver takes this fact into account when forming beliefs about the state of the world given the signals *low* or *high*. Given $n = low$ the politician will chose the action

$$x_l^* = \frac{sp(b)}{2}$$

and

$$x_h^* = \frac{1 + sp(b)}{2}$$

if $n = high$. Or with $sp(b)$ plugged in

$$x_l^* = \frac{1}{4} - b$$

and

$$x_h^* = \frac{3}{4} - b$$

C.2 Welfare with Commitment

We model trust through a commitment to the actions

$$x_l^* = \frac{1}{4}$$

and

$$x_h^* = \frac{3}{4}$$

Given these actions, the switching point of the bureaucrat will be $sp(b) = \frac{1}{2} - b$ and ex ante utility of the politician is

$$EU_{pol} = \int\limits_{0}^{\frac{1}{2}-b} -\left|m - \frac{1}{4}\right| pol - \int\limits_{\frac{1}{2}-b}^{1} \left|m - \frac{3}{4}\right|$$

For $|b| \leq \frac{1}{4}$ this can be simplified to

$$EU_{pol} = -\frac{1}{8} - b^2$$

For $\frac{1}{2} \geq |b| > \frac{1}{4}$

$$EU_{pol} = -\frac{1}{8} - \frac{1}{2}b^2 - \frac{1}{8}|b|$$

And finally for $|b| > \frac{1}{2}$ the bureaucrat will only send one kind of signal, the utility for the politician is then $EU_R = -\frac{5}{16}$.

We compare these outcomes to the ex ante utility the politician receives if he cannot commit to believe the bureaucrat and chooses the action $x^* = \frac{1}{2}$. His expected utility in that case is $EU_R = -\frac{1}{4}$. Taking a look at the different intervals above we see that the politician will be indifferent between trust and $x^* = \frac{1}{2}$ for some $\frac{1}{2} \geq |b| > \frac{1}{4}$. To be precise he will ex ante prefer to commit if

$$-\frac{1}{8} - \frac{1}{2}b^2 - \frac{1}{8}|b| \geq -\frac{1}{4}$$

or

$$|b| \leq \frac{\sqrt{15} - 2}{8}$$

C.3 Equilibrium with Unknown Types

First note that the equilibrium actions x_l and x_h are still given by the conditional means

$$x_l = E(m \mid n = "low") = \frac{\int\limits_{-\theta}^{\theta} f(b) sp(b) \frac{sp(b)}{2} db}{\int\limits_{-\theta}^{\theta} f(b) sp(b) db}$$

and

$$x_h = E(m \mid n = "high") = \frac{\int\limits_{-\theta}^{\theta} f(b)(1 - sp(b)) \frac{1 + sp(b)}{2} db}{\int\limits_{-\theta}^{\theta} f(b)(1 - sp(b)) db}$$

Note that the politician updates his beliefs on m according to bayes rule. Most importantly, he incalculates the probability that the signal is sent by an bureaucrat with type b. We can simplify these terms by noting that the switching points will never be smaller than 0 or larger than 1, i.e. $sp(b \mid b > 0) = max(0, sp(0) - b)$, $sp(b \mid b < 0) = min(1, sp(0) - b)$.

The equilibrium action for $n = low$ is then

$$x_l = \frac{1}{2} \frac{\int\limits_{sp(0)-1}^{sp(0)} f(b) \left[sp(b)^2 \right] db + F(sp(0) - 1)}{\int\limits_{sp(0)-1}^{sp(0)} f(b) sp(b) db + F(sp(0) - 1)}$$

Now note that the actions x_l and x_h have to fulfill the following condition $\frac{x_l+x_h}{2} = sp(0) = \frac{1}{2}$. This finding rests on the assumption of a symmetric distribution of types. Note that the symmetric distribution implies that for any $sp(0)$ there are equally many types with a switching point larger $sp(0)$ and lower $sp(0)$. For $sp(0) = \frac{1}{2}$ the ex ante probability of receiving a signal $n = high$ is therefore exactly $\frac{1}{2}$. For $sp(0) > \frac{1}{2}$ the probability of $n = high$ is then strictly lower $\frac{1}{2}$. Why will this always lower the expected utility of the politician?

Regardless of the signal sent, the politician tries to minimize the expected distance between the action, x, and the state of the world, m. If $sp(0)$ increases, this expected distance must increase for $n = low$ and decrease for $n = high$. The politician therefore raises the ex-ante probability of getting a lower expected payoff by playing actions that violate $sp(0) = \frac{1}{2}$.

With $sp(0) = \frac{1}{2}$ we can simplify the nominator

$$\int_{sp(0)-1}^{sp(0)} f(b) \left[sp(b)^2 \right] db = \int_{-0.5}^{0.5} f(b) \left[sp(0)^2 - 2sp(0)b + b^2 \right] db$$

$$= (1 - 2F(-\frac{1}{2}))\frac{1}{4} + \int_{-0.5}^{0.5} f(b)b^2 db$$

and the denominator

$$\int_{sp(0)-1}^{sp(0)} f(b)sp(b)db = \left[1 - 2F(-\frac{1}{2}) \right] sp(0)$$

The *low* action of the politician is then given by

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$$x_l = \frac{1}{2} \frac{(2F(\frac{1}{2}) - 1)\frac{1}{4} + \int\limits_{-0.5}^{0.5} f(b)b^2 db + 1 - F(\frac{1}{2})}{[2F(\frac{1}{2}) - 1]\frac{1}{2} + 1 - F(\frac{1}{2})}$$

$$= (2F(\frac{1}{2}) - 1)\frac{1}{4} + \int\limits_{-0.5}^{0.5} f(b)b^2 db + 1 - F(\frac{1}{2})$$

$$= \frac{3}{4} - \left[\frac{F(\frac{1}{2})}{2} - \int\limits_{-0.5}^{0.5} f(b)b^2 db \right]$$

Similarly we can rewrite for the action triggered by the signal $n = high$

$$x_h = \frac{1}{2} \frac{\int\limits_{sp(0)-1}^{sp(0)} f(b)(1 - sp(b)^2)db + F(-sp(0))}{\int\limits_{sp(0)-1}^{sp(0)} f(b)(1 - sp(b))db + F(-sp(0))}$$

$$= \frac{1}{2} \frac{(1 - 2F(-\frac{1}{2})) - \int\limits_{sp(0)-1}^{sp(0)} f(b)sp(b)^2 db + F(-\frac{1}{2})}{\frac{1}{2}}$$

$$= (1 - 2F(-\frac{1}{2})) - \left[(1 - 2F(-\frac{1}{2}))\frac{1}{4} + \int\limits_{-0.5}^{0.5} f(b)b^2 db \right] + F(-\frac{1}{2})$$

$$= \frac{1}{4} + \frac{F(\frac{1}{2})}{2} - \int\limits_{-0.5}^{0.5} f(b)b^2 db$$

Note that there are two equilibria: *babbling* and the one described here.

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Both parties ex ante weakly prefer to be in the informative one. The bureaucrat can trigger the action that he likes more and therefore even ex post prefers the informative equilibrium. The politician either chooses actions $x_l = x_h = \frac{1}{2}$ or he strictly prefers to be in the informative equilibrium. As long as there is some probability that the bureaucrat is of a type $b \in \left(-\frac{1}{2}, \frac{1}{2}\right)$, the bureaucrat will have two distinctly different actions. If the share of radical bureaucrats is large, i.e. as $F(-\frac{1}{2})$, $1 - F(\frac{1}{2}) \to \frac{1}{2}$, the actions of the decision maker are close to $\frac{1}{2}$.