Controlling Federal Agencies: The Contingent Impact of External Controls on Worker Discretion and Productivity

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Abstract

Previous scholarship in political science and public choice has investigated why legislatures sometimes choose to delegate policy choice to executive agencies, and sometimes make their own detailed choices, but there is little research on the consequences of the choice to delegate or not. Using a principal-agent framework with multiple principals, this paper provides empirical evidence regarding the actual consequences of legislative delegation and agency discretion on the work of U.S. government employees. The findings suggest that delegation directly affects both employee discretion and productivity. Legislative delegation is also associated with more executive political appointees, whose presence reduces both employee discretion and productivity. The findings also show that whether employees with more discretion are more productive than those with less depends on their commitment to the job: employees who are motivated by liking their work more than their pay use their discretion to enhance productivity, while employees who are motivated by liking their pay more than their work use their discretion to reduce productivity. This is further evidence that, at least in the public workplace, intrinsic motivation matters.

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Introduction

There are many theories regarding the choice by a legislature to delegate authority to executive branch agencies, or to retain that prerogative for itself. (For examples, see Epstein and O'Halloran, 1994, 1999; Hammond and Knott, 1996; Horn, 1995.) There are even some empirical tests of these theories.[1] However, there are few investigations of the consequences of the decision to delegate. The purpose of this paper is to examine whether legislative delegation of discretion to agencies is reflected in the discretion of individual agency employees[2], and in the productivity and quality of their work.[3]

Several alternative outcomes seem theoretically likely. One possibility is that, when the legislature chooses to place discretion in the agency, the White House steps in to prevent agency drift by using political appointees to control the work of agency employees. This would simply replace delegation from the legislature with control from the executive, resulting in no increase in the discretion of agency employees. (This is most likely when government is divided, or when the preferences of the median legislative oversight committee member differ from Presidential preferences.) Another expectation is that legislative delegation is not entirely replaced by executive control, resulting in agency discretion. This may simply push the original problems of high legislative decision-making and transactions costs, and the resulting problems of legislative committee drift, downward into the bureaucracy. When legislative and

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[1] Langbein (2000) compares delegation and discretion in the public and private sector, but the evidence pertains only to one occupational sub-profession (electrical engineers).

[2] This study does not examine delegation to the courts. Recognizing that "the bureaucracy" is not "a single organism", it recognizes "diverse sets of public servants in different agencies" (Kaufman, 2007).

[3] I use the term "productivity", "performance," and, less frequently, "output" interchangeably. The best term is probably "performance," since it is the most general, compared to "productivity", which is output per person hour. My usage of these terms interchangeably reflects common practice. I also regard the measures of productivity as indicative of the absence of shirking. My specific measure is a scale of self-reported productivity plus quality, and (in one analysis), contribution to agency mission. The ultimate impact of discretion on the consequences of individual productivity in respect to the allocative and technical efficiency of bureau performance remains an open question that is beyond the scope of this research.

executive overseers grant agencies considerable discretion with broad legislation, flexible rules, and reliance on career rather than political top managers, bureau employees can use their expertise and discretion to work productively to further agency goals, or they can use their discretion to shirk. They can shirk by being "lazy", or by using their expertise to work in ways that may not be related to agency goals. Another possibility is that bureaus with discretion delegate decisions to lower level officials, but severely constrain them with rules and excessive supervision. In this case, lower level employees in agencies with top-level discretion find themselves with little discretion. Officials with little discretion may then report being productive in doing their assigned work, or they may report that they are unproductive, either by not working "hard," or by "working" but not helping the agency mission.

What happens when democratic principals in a separation-of-power governance system delegate discretion to agent-employees? Facing multiple and often disagreeing principals, employees may find themselves with considerable discretion; they could also find their discretion constrained by political appointees or middle managers. If bench-level employees find they have considerable discretion in how they do their job, they could either "shirk" or "work." The outcome could also depend on the employee's utility function: employees primarily motivated by intrinsic values (relative to money) may respond to delegation differently from employees motivated primarily by money. Gailmard and Petty (2007) model these interactions formally, showing that the presence of normatively motivated agents (along with job security) is an equilibrium choice for legislatures when they lack policy expertise. I explore these dynamics empirically.[4]

This paper regards legislative delegation and executive control by political appointees as exogenous to employee discretion and productivity, at least in the short

[4] The measures I use are connected to the key elements of principal-agent theory. There are legislative overseers who grant more discretion to some agencies than others; there are varying levels of political control by the elected chief executive that is exercised by political appointees; control is also exercised by mid-level managers (supervisors); some employees find themselves with more discretion than others; and some employees "shirk" more than others, since some employees are less productive than others. The results can reveal "moral hazard" when more discretion is associated with less productivity. The results can reveal a form of felicitous (or adverse) selection if employees who have more control over their job (i.e., more discretion) are more (or less) productive (i.e., shirk less or more).

run.[5] It provides empirical evidence regarding the actual consequences of legislative delegation and the presence of political appointees on the discretion and productivity of U.S. government employees. The findings suggest that legislative delegation (i.e., overall agency discretion) is sometimes associated with greater executive oversight (i.e., more political appointees), but the result depends on other agency characteristics such as the technical complexity of the task. Only sometimes do employees in agencies that appear to have relatively less discretion than others report having less discretion, controlling for numerous other employee and agency characteristics. Political appointees systematically reduce employee discretion. In some cases, agency delegation has a direct effect on employee productivity, but the sign of the effect also appears to depend on other agency characteristics. Political appointees, however, reduce employee productivity. Independent of agency discretion and the presence of political appointees, whether employees with more discretion are more productive than those with less depends on the nature of their commitment to the job: employees who are motivated by liking their work more than their pay use their discretion to enhance productivity, while employees who are motivated by liking their pay more than their work use their discretion to reduce productivity. This provides evidence that, at least in the mostly white-collar federal workplace, selection (or self-selection) based on commitment to one's own work (intrinsic values) can drive out shirking or moral hazard (extrinsic values).

Delegation and discretion in public bureaus

Discretion is the power or the right of deciding according to one's own judgment. If the legislature decides to delegate to the executive rather than to decide for itself, the legislature is cast as a principal, the bureau as an agent. Under many circumstances, we can expect that the principal-agent problem of moral hazard and adverse selection will characterize agency discretion, driving agents with discretion to shirk. Others contend that felicitous selection (and retention) of agency personnel can sometimes counterbalance the problem of moral hazard (Miller, 2000).

[5] Krause (1996; 2007) points out, that, over time, employee actions sometimes influence the principals' principles.

But agency discretion is not randomly assigned. Understanding the reasons for delegation affects theoretical expectations about its likely impact on both employee discretion and productivity. This section outlines theories about causes of delegation and the expected consequences for employee discretion. The following section considers consequences for employee productivity. The theoretical expectations drive the specification of the variables in the empirical model.

Disagreement among principals

Delegation is often thought to increase when multiple principals disagree. All employees in federal agencies work in a setting where disagreement among multiple principals is common, even when the government is unified. But the scope and dimensions of disagreement are greater for some agencies than others. For example, perhaps because of their position as a national monopoly, there is usually less disagreement among political principals in foreign and defense policy than in regulatory policy, where the disagreements are particularly pernicious and where affected groups (big business, small business, public interest groups, professional safety and environmental interests, etc.) are politically active. Political disagreement is also a continuing property of client service agencies involved in distributing (or redistributing) services or monetary resources.

One set of arguments predicts that disagreement among multiple principals will increase employee discretion. When there is disagreement among multiple principals-- the President, the House, and the Senate, each with an effective veto over the others-- the time and political costs of deciding also increase accordingly. Politicians reduce these transactions costs by agreeing on a vague policy, delegating the details to the agents, who then have more discretion (Hammond and Knott 1996, Steunenberg 1996, Torenvlied 1996, Ferejohn and Shipan 1990, Wood and Waterman 1994, Moe 1990, Ferejohn and Shipan 1990, Noll and Weingast 1991, Horn 1995, Simon 1946, and Long 1949).

It is also possible that disagreement among multiple principals reduces rather than expands agents' discretion. Political conflict among principals engenders more rules, reducing agents' discretion (Moe, 1990; Scholz, 1991). Instead of producing output,

employees spend time complying with rules (Kelman, 1990; Thompson, 1998; Fehr and Gachter, 2000b).

Political appointees

As disagreement among principals increases, two other consequences are likely. First, the executive has more incentive to control the activities of agents by using political appointees to closely monitor the activities of career agency employees. Empirically, this means that the presence of political appointees in an executive agency is expected to reduce the discretion of agency employees. Political appointees could possibly increase the mission oriented output of employees, but that is not necessarily the case, especially when agency employees and the executive do not share the same view of the agency mission, or when agency employees are caught between the competing expectations of disagreeing principals (Gilmour and Lewis, 2006; Weimer, 2005; Besley and Ghatak, 2005).

Uncertainty

Disagreement among principals may also increase the decision-making costs of reaching an agreement among principals on what the agents are to do, and on what rules they are to follow. One way to reduce these decision-making costs is to be vague concerning agents' tasks and even about the rules (Horn, 1995; McCubbins and Page, 1987; Wood and Waterman, 1994), introducing uncertainty into agents' conceptions of what the principals preferences are (Bawn, 1995; Spence, 1997). In the face of uncertainty about principals' preferences, the risk-averse employee does what everyone else around him is doing, which is the same thing that was done yesterday, as long as those actions evoked no adverse reaction by any of the principals. The usual characterization of such an organization is that it is stagnant, inefficient, and unresponsive (Wood and Waterman, 1994: 147; LaPorta et al., 1997; Light, 1995).

Uncertainty also increases with the distance between principal and agent (Langbein, 2000). Distant principals lack information about what the agent is doing, and the agent does not know what each distant principal wants. Further, the higher up on the organizational hierarchy the principal is, the easier it is for principals to resort to

vagueness to reduce their decision-making costs, which contributes to uncertainty on the part of agents.

There are many other sources of uncertainty that affect the relations between principals and agents in public institutions. Calvert, McCubbins and Weingast (1989); McCubbins, Noll and Weingast (1987); and Epstein and O'Halloran (1999) point not only to principals' uncertainty about the precise location of agents' preferences, but also to the principals' uncertainty about eventual outcomes, as sources of agents' discretion.

Empirically, the expectation is that employees who are unclear about what they are to do, or unclear about the relation between their daily activities and the agency mission, will report that they have less discretion. They are also likely to be less productive.

Task complexity

When task are complex, employees are likely to have more discretion (Horn, 1995; McCubbins and Page, 1987; Heiner, 1983; Bhattacharya and Teske, 1994). This is particularly likely in agencies whose core technology requires hard science and engineering. The technical agencies include NASA; Dept. of Defense; and the FAA. In these cases, the legislature does not have the expertise to carefully circumscribe agency activities, but it does have the incentive to impose "red tape" and numerous reporting requirements. However, the overall effect on individual employees is expected to be neutral: there is considerable substantive but little procedural discretion. In these agencies, the White House is unlikely to fill the hole left by legislative discretion with political appointees, but the absence of political appointees may mean that both the executive and legislative overseers have an increased incentive to use burdensome procedural regulation to reduce employee discretion (Kellman, 1990).

Output hard to measure

Other agencies are complex because their output is hard to measure. When output is hard to measure, political disputes may be particularly difficult to resolve, and monitoring will be also be costly. For example, it is considerably easier to monitor the output of EPA (number of regulations; improvement in environmental quality) than it is

to monitor the output of the State Department ("good" foreign relations), the Dept. of Defense (national security), or even the Dept. of Justice ("justice"; domestic security). The expectation in this case is that agency substantive discretion cannot easily be controlled by procedural constraints, so that this type of agency discretion will lead to greater employee discretion.

When agency tasks are relatively easy to measure, it is less costly for legislators to write clear regulations to guide agencies. Even when there is political disagreement, the eventual decision about the level and distribution of benefits (agriculture, welfare, housing, Medicaid, Medicare, education, etc.) can be settled by a logroll (Weingast, Shepsle and Johnsen, 1981). The consequence is that, in general, employees in client service agencies (Agriculture**,** HHS, HUD, SSA, Dept. of Education, FAA, Treasury (especially IRS), Veteran Affairs, and GSA) may find themselves with little discretion. On the other hand, when output is easy to measure, monitoring can also be ex post. Customers can directly monitor the performance of client service agencies, as they judge the speed, accuracy, quality, and quantity of the service immediately after it is delivered. This also leads to the expectation that employees in client service agencies will report that they have less discretion than comparable employees in other agencies. They may also report greater productivity.

Internal Monitoring

Principals increase their control of agencies by structuring agencies to facilitate both *ex ante* and *ex post* monitoring of agency decisions by interest or other outside groups, but the most direct monitoring of agency employees is by their supervisors. Supervisors can also control employees with either *ex ante* and *ex post* monitoring. *Ex ante* monitoring is direct oversight by attentive supervisors, whose approval is needed before the next step can be taken. More time is spent supervising and checking up, and, on the agent's side, responding, and waiting for instructions and approval. The end result is a less effective, productive organization (Ammons and Newell, 1989; Milgrom and Roberts, 1992). Monitoring can also be *ex post*. *Ex post* monitoring (e.g., monitoring by performance standards) is believed to be compatible with more discretion and greater

effectiveness (Thompson, 1991, 1993, 1998). Supervisors can give employees discretion and then monitor their individual or collective success.

Discretion also varies positively with the amount of monitoring by customers or clients. They are likely to be particularly important to client service and regulatory agencies, and their monitoring is always ex post (Brehm and Gates, 1997: ch. 9). When employees feel pressed to respond to clients, they may report reduced discretion.

Discretion and productivity in public bureaus

Employee discretion could either facilitate or reduce employee productivity in federal agencies. In fact, there are many reasons to believe that the direction of its impact may depend on characteristics of the agency, the employees' monitors, and employee preferences.

Monitoring: political appointees, mid-level managers, peers and clients

The usual assumption in the context of the dominant principal-agent model is that agents, left to their own discretion, will either shirk (that is, do nothing), or do something that the principals do not want (sabotage or bureaucratic drift) (Brehm and Gates, 1993, 1997). According to this theory, no matter what the reason for delegation, principals who delegate to agents lose control, and must balance that against the decision-making and other costs of not delegating. Congress not only faces that delegation dilemma with respect to executive agencies; the same dilemma exists within each executive agency (Miller, 2000). Thus, "solving" the legislative-executive principal-agent problem only pushes it down to another level within the executive.

In theory, opportunities for agents' moral hazard can be constrained with persistent monitoring by principals and by the design of information-revealing agency procedures and efficient reward systems. With respect to rewards, optimal incentive systems appear impossible when the work product requires joint effort, and when outcomes are hard to measure.[6] Compared to private organizations, reward systems in

[6] There is no ex ante incentive system that simultaneously motivates agents to take actions that are Pareto optimal for the principal(s), does not waste money, and meets a budget constraint (Holmstrom, 1982; Miller, 2000, 2001). (See Baker, 2000, for an example of an effective incentive system when work is not jointly produced.)

the federal government, while they make some use of pay-for-performance, are less flexible, and may be counter-productive (Radin, 2006).

In the absence of ready access to flexible and powerful pay-for-performance incentives, agencies have ready access to the use of political and non-political supervisors to monitor the work of lower level employees: there are many monitors in public agencies. Supervision can either increase or reduce employee discretion and productivity. Political supervision can potentially augment mission-oriented output, or it can reduce productivity when agents face conflicting expectations between political and career supervisors. Similarly, career supervisors can facilitate communication between political principals and employees, increasing employees' output, or they can be barriers to productivity.

Monitoring by professional peers signals the presence of "trust." Professionals in the same field share similar values and have repeated contacts; they have an incentive to cooperate because they know that professional peers are a source of future assistance (LaPorta et al., 1997; Kreps, 1990, 1997). Thus, an organization governed by the norms of a single profession compared to one governed by a more diverse set of principals is not as likely to be encumbered with rules and disagreeing, distant principals that are likely to reduce both discretion and effectiveness.

Monitoring by peers also occurs within workgroups. Workgroup productivity could either increase or decrease individual productivity. Individuals in cooperative, productive work-groups will be more productive if the productivity of others signals trust and expectations, especially when effort is costly to observe (Whitford and Ochs, nd; Arcem and Gunn, 2005). However, it is also possible that exactly the same situation invites free-riding and less work by individual employees.

Customers or clients may be another important monitoring group. Their monitoring is likely to be ex post. Ex post monitoring, while not foolproof, may induce more productivity than ex ante monitoring (McCubbins and Schwartz, 1984; Thompson, 1998). The usual assumption is that monitoring by this set of principals is more prevalent in the private than the public sector. However, it is the importance of the customer/client that is relevant, and not just the sector (Thompson, 1998; Barzelay, 1992; Bozeman, 1987; Langbein, 2000). The expectation is that employees in client-oriented public service

organizations, while they may report little discretion, will be more productive than comparable employees in other types of agencies.

The agency: multiple principals and uncertainty; size; and task complexity

Government agencies in the U.S. have multiple principals, each with veto power over the agency. Dixit (1997) adds that, when multiple principals disagree, and, by extension, when their conflicting preferences are unclear, employees have weak performance incentives; they are answerable to different constituencies with conflicting and often unclear preferences. In being beholden to everyone, they are beholden to no one. The consequence is not only less discretion, but also a less effective organization. Thus we expect that employees who are unsure about what is expected of them, and unsure about the relation of their job to the mission of the agency, will not only report less discretion, but less productivity too (Whitford and Ochs, nd).

Government agencies also vary in size. La Porta et al. (1997) argue that, as organizations grow in size, norms become more diverse, and trust and cooperation decrease. The larger the organization, the fewer the repeated interactions there will be between any two employees, or between employee and customer. In the absence of trust, these one-shot contacts, characteristic of large organizations, become non-cooperative games, whose equilibrium is not optimal for the organization (Miller, 1992). Further, without trust, managers in large organizations are especially likely to invoke rules and active ex ante monitoring of employees. They are also likely to be more distant from agents, promoting uncertainty among agents about principals' preferences. Bohte and Meier, 2001 and Meier and Bohte, 2001 show that organizational complexity and the span of control of the organization's top and mid-level managers, both characteristics of large organizations, affect employee discretion and productivity. For these reasons, the implication is that employees in large agencies may report not only less discretion, but also lower productivity.

Task complexity is important too. The dominant principal-agent models that frame the issue of discretion as a moral hazard dilemma assume that principals' preferences are exogenous with respect to agents. However, agent discretion may come entirely or partly from their ability to influence the preferences of their principals, and

thereby to control their own agenda (Niskanen, 1975; Krause, 1996; Wood and Waterman, 1994). The ability of agents to control their own agenda may be greater when tasks are highly technical and when there are few competing sources of supply or information. This may be particularly likely in the case of public supply of national defense, the space program, and foreign policy, and in some areas of technical regulation. One consequence is greater discretion in highly technical agencies. However, the absence of competition could also reduce productivity in these highly technical agencies: there is no competition in the supply of national defense or foreign policy in the U.S. By contrast, social services are produced by government agencies at all levels, and by the non-profit sector as well, and there is no information monopoly in social services. Thus task complexity could reduce individual productivity. By contrast, employees in non-technical service agencies may report higher levels of productivity.

Employee preferences: love or money?

In light of the recognition that the moral hazard problem between agents and principals may be intractable, growing theoretical and empirical evidence suggests that selection can reduce the moral hazard dilemma in a repeated principal-agent game (Brehm and Gates, 1997; Miller, 2000; Langbein, 2002). First, even in non-repeated games, many players cooperate even when the dominant solution is to defect (i.e., do nothing or maximize individual rather than group gains) (Fehr and Gachter, 2000a, 2000b; Orbell, 1991; Ostrom, 1998). Second, workforce games are repeated, and cooperation increases in repeated games (Fehr and Gachter, 2000a, 2000b). Third, non-cooperators are more likely to cooperate when others do (Orbell, 1991). Fourth, there is evidence that people work not only for instrumental ends (e.g., to make money) but also to pursue consumption values (Frey, 1994; 1997; Deci and Ryan, 1985, 2000; Kreps, 1997; Besley and Ghatak, 2005). In the context of the public service, these correspond to "policy-motivated" agents (Gailmard and Patty, 2007). Fifth, when people work for intrinsic values, they are more likely to cooperate with others who share those values. When such a cooperative "heuristic" prevails, it appears that exclusive reliance on extrinsic rewards and sanctions (such as performance pay, ex ante monitoring, and ex ante and ex post sanctions) actually crowds out intrinsic values (Scholz, 1991; Frey,

1994). The implication is that careful selection or retention of agents who value intrinsic more than extrinsic rewards can reduce the moral hazard dilemma (Frank, 1991; Schotter, 1998; Miller and Whitford (nd); Miller, 2000; Besley and Ghatak, 2005; Gailmard and Patty, 2007). Thus, we should observe that federal workers who have discretion and "love" their job, are more productive than otherwise similar workers with similar amounts of discretion, but who are less intrinsically devoted to their job.

Overall, norms, including satisfaction with ones job, are expected to matter for productivity. Specifically, employees with discretion will be more become more productive as the intrinsic value of their work, relative to the extrinsic value, increases. By contrast, employees with discretion will be less productive as the commitment to work for money, not love, increases.

Other factors

It is also necessary to control for potentially confounding personal characteristics in testing these expectations. I control for pay grade, pay type, education, experience, whether the respondent is a supervisor, gender, and race.

Evidence from U.S. federal government agencies

This study uses measures of employee discretion and productivity developed from the 2000 survey of federal employees carried out by the Merit Systems Protection Board (MSPB). It assesses whether employees in agencies that are given more discretion by the legislature actually have more discretion to do their jobs, and whether that discretion results in shirking or working.

The survey was mailed to 750 employees selected randomly from each of 23 executive branch agencies, for a total possible sample of 17250 respondents. The 41% response rate was typical for surveys of this nature. The MSPB reports that the demographic characteristics of respondents did not differ significantly from the characteristics of the survey population (van Rijn, 2005).

There are two dependent variables in this study: employee discretion and productivity. Productivity is assumed to be endogenous to discretion, and both are

endogenous to the various external characteristics of multiple external and internal principals. The two equations can be written as:

$$Y1 = f(X1, Z1, Z, \mu_1) \quad (1)$$

$$Y2 = f(X1, X2, Y1, Z2, Z, \mu_2) \quad (2)$$

where Y1 = employee discretion; Y2 = employee productivity; X1 = theoretically relevant exogenous variables in both equations (agency type, political appointees, supervisors, agency size; job clarity); X2 = theoretically relevant exogenous variable in (2) (intrinsic relative to extrinsic motivation); Z1, Z2 = control variables unique to (1) and (2), respectively; Z = control variables shared by (1) and (2); and μ_1 , μ_2, the stochastic terms in (1) and (2) respectively, and which are expected to co-vary substantially. (The variables unique to each equation have no significant impact when included in the other equation.)

It is important to understand the properties of these stochastic terms. Because of random measurement error typical in survey responses; because the variance in the random component is unlikely to be constant; and because the same respondents are used to estimate both equations, the stochastic terms in both equations are assumed to be similarly heteroscedastic. It follows that it would be unreasonable to assume that the stochastic terms for respondents in the discretion equation are independent of the stochastic terms for respondents in the productivity equation.

This implies that equation (2) cannot be regarded as entirely independent of equation (1). Consequently, the estimation method uses two stages. The first stage estimates equation (1) using robust standard errors to reduce heteroscedastic errors expected from the randomness likely in individual responses to survey questions. The second stage uses the variables in Z1 as instruments for discretion in equation (2) in order to reduce the inevitable measurement error that would otherwise bias estimation of the impact of Y1 (discretion) on Y2 in equation (2). That is, the value of Y1 (discretion) predicted by equation (1) (i.e., Y1-hat), and identified by Z1, is used instead of Y1 in equation (2). Like equation (1), equation (2) also estimates parameters with robust standard errors. The advantage of this two stage method is that it controls explicitly for

heteroscedastic responses in each equation. It also reduces sources of noise in a theoretically critical independent variable (discretion) that would otherwise bias an estimate of its impact (on productivity).[7]

The Endogenous Variables

The study measures discretion at the individual level with a scale comprised of 3 indicators. The first indicator is the response to the survey item, "At the place where I work, my opinions seem to count." Responses range from 5 (strong agreement) to 1 (strong disagreement). The mean = 3.29. The second indicator is the response to the question, "In the past two years, I have been given more flexibility in how I accomplish

[7] Two-stage regression to reduce random measurement error is hazardous if the predicting equation is weak. In this case, the predicting equation is not weak; equation (1) explains 47% of the variance in Y1 (discretion). Thus, the "noise" in Y1-hat is about half the amount that would be present in an unadjusted version of Y1. I also estimated the equations generating the results reported in Table 2 and 3 with standard errors clustered by agency. The clustered standard errors were slightly larger than those reported, but this effect appears often in the third decimal place and in no case changes the conclusion about significance. I also estimated the results in Table 2 and 3 with agency fixed effects (using either robust or clustered standard errors). Once again, the basic results reported in Tables 2 and 3 do not change. Predictably, the use of agency fixed effects produces collinearity between some of the agency type dummies, political appointees, and the separate agency dummies, but the basic results for the impact of mid-level supervisors and conditional discretion do not change. Most importantly, using fixed effects does not raise the R-square at all. In this particular case, it is easy to choose the results from the model that includes theoretical variables and no a-theoretical dummy variables over the model that includes both types of variables. While it is never possible to rule out the possibility of omitted variable bias in non-experimental designs such as this, these results imply that it is unlikely that the omitted variables are related to omitted agency-specific characteristics.

Another form of two-stage regression is appropriate in the case of simultaneity. Simultaneity is likely if discretion influences performance, and, at the same time, individual productivity or performance influences discretion, such that productive employees are given more discretion; or even less discretion, if the principal or supervisor believe the employee is performing in ways that hurt the agency mission, as they define it. Consistent parameter estimates in this situation require identifying at least one variable that predicts Y1 (and another that predicts Y2), but has no direct impact on Y2 (and, respectively, no direct impact on Y1). Workgroup productivity and the square of workgroup size play that role for the discretion equation (Y1). I do not claim that the productivity equation (Y2) is identified, for two reasons. First, it is not clear that the equation needs to be identified to accomplish the goals of this study. For this study, it is sufficient to establish an overall association between the two, conditional on motivation. My focus is on the external, exogenous determinants of employee discretion, and not on how discretion is negotiated between productive (and unproductive) employees and their supervisors. Second, sorting out simultaneous relations requires identifying a variable that has no effect on productivity but has a direct effect on discretion; it is not clear what that variable would be. Based on the results in Table 2 and 3, being a supervisor might be such a candidate. Because the full equation for productivity in Table 2 (and 3) has more error than the equation for discretion, the result would be an identifying equation for productivity which also has a poor fit. Creating an instrumental equation that is a poor predictor of the variable to be identified would fail to solve the simultaneity problem. For the purposes of this study, it is better to live with the possibility that the coefficients relating discretion conditionally to productivity may be just that: relational and not causal.

my work," also scored on a 1 to 5 scale of agreement (mean = 3.30). The third is the level of agreement to "Employees participate in developing long-range plans in my work unit" (mean = 2.62). The reliability (Cronbach's alpha) of a 3 item summative scale of these items is 0.71. Principal components factoring resulted in one factor with loadings of .85, .77 and .77 for each of the items, respectively. These results imply that the 3-item scale reliably measures a unidimensional concept. The scale mean is 9.51; the standard deviation is 2.76, and the range is from 3 to 15, indicating that there is considerable variance in discretion among Federal employees.

The study also uses a subjective, compound measure of individual performance. Respondents were asked to rate their individual productivity on a 10-point scale, from 1, "Not at all productive," to 10, "Extremely productive." The mean score for individual productivity was 8.47 with an observed range of 1 to 10, but a relatively small standard deviation of 1.37. Respondents were also asked to rate the quality of their own work on a 5-point scale, where 1 is "Poor" and 5 is "Outstanding." The mean rating is 3.26, with an observed 1 to 5 range, and a standard deviation of only .60. In order to make both items numerically equivalent, I divided the first indicator (individual productivity) by 2 to make it equivalent to the 5-point quality scale. I then added a third component to the scale, reflecting a third element of productivity: the extent to which the work the employee performs contributes to the accomplishment of the agency's mission. This was also measured on a 10-point scale, which I divided in half, and then added the response to the other two indicators.

The result is an additive index that reflects three central components of productivity, in the context of the literature on shirking. The absence of shirking means that employees work hard (quantity, or self-reported productivity), work well (quality), and contribute to the mission of the unit, rather than "do their own thing." The composite index, ranging potentially from a score of 2 to 15, captures each of these components. The actual mean is 12.3. While the standard deviation is only 1.8, and the range is from 5 to 15, exhibiting considerable variation for analysis.

However, the index is not clearly unidimensional. While factor analysis yields 1 underlying dimension, the dimension explains only slightly more than 1/3 of the factor

space, and Cronbach's alpha is only .64. It is quite possible that this measure in fact captures the very tension that it is supposed to capture: the variable with the lowest loading on the factor is the employee response to "contributing to the mission of the unit." That variable is the least highly correlated with the other two: employees who report that they work "hard" and "well" may also believe that they are not necessarily contributing to the mission of the unit. I investigate this possibility by comparing the impact of political employees and intrinsic (relative to extrinsic) norms on each of the three output measures measured separately. The results for quantity and quality, measured separately, reflect the results for the overall index reported below in Table 2. I do not report those separate estimates. However, as Table 3 shows below, the role of political appointees is different when it comes to mission output, measured alone, than it is when productivity is measured as a three-component composite scale in Table 2.

Theoretically Relevant Independent Variables

Agency type

I use a series of dummy variables for groups of agencies as a proxy for the likely legislatively determined discretion of each agency. These variables include task complexity, whether the output is hard to measure, and political disagreement. My grouping correlates with the discretion score devised by Epstein and O'Halloran (1999: 189). Their score reflects two components: delegation and constraint. When governing committees draft legislation that gives agencies considerable discretion, they also usually constrain that discretion with additional procedural constraints. The resulting discretion score is the difference between delegation and constraints.

For example, I expect that technical agencies (DOD and its armed services components, NASA, and FAA) have the greatest amount of discretion granted to them by the legislature. According to Epstein and O'Halloran, the Armed Services and Space Science and Technology Committees produce legislation affecting DOD and NASA with the highest discretion scores. These are areas of considerable technical uncertainty among legislators; uncertainty about political outcomes could also be high in this area. Rather than use a score, I group the 6 agencies (DOD, Army, Navy, Air Force, NASA,

FAA) together with a single indicator variable. The agencies that I code as technical also have high discretion scores (45%, compared to the mean of 28%).

By contrast, I expect the client service agencies to have relatively low discretion, since the issues are not technical and Congressional staff can assist in writing grant formulas and rules that direct the money as Congress wishes. Consistent with this expectation, domestic service agencies (e.g., HUD, Education, and Labor) are governed by legislation that has lower Epstein-O'Halloran discretion scores (about 20%) than DOD-NASA. In this area, there is also considerable liberal-conservative disagreement on a multitude of issues (e.g., centralization vs. decentralization of decision-making authority to the states; level of the benefits; rules regarding the behavior of beneficiaries), but technical uncertainty is fairly low. I group the client service agencies together. They include Agriculture, HHS, HUD, VA, SSA, Department of Education, FAA, Treasury (which includes IRS), and GSA. As a group, these agencies have the lowest discretion scores of any, averaging 19% compared to the overall mean of 28%. In fact, the very lowest discretion scores (about 8%) apply to legislation emerging from Ways and Means and governing the IRS. In this area, while there is liberal-conservative disagreement regarding the optimum amount of federal revenues, a median should readily emerge so that political disagreement is unlikely to persist. Further, there is little technical or political uncertainty in this area.

I expect regulatory issues to be very complex politically, and technically more complex than issues managed by client service agencies but less complex than issues managed by DOD and NASA. Regulatory agencies should therefore have moderate levels of discretion; they may have considerable substantive discretion because of technical uncertainty, but they also have little procedural discretion because of political uncertainty. Using the Epstein and O'Halloran discretion score, legislation emerging from the Energy and Commerce committees lies at about 22%, which is between the extremes of the Armed Services and domestic service agency committees, and close to the mean score of 28%. I include as regulatory agencies EPA, Commerce, Dept. of Energy, Dept. of Transportation (and FAA), Dept. of Labor, Dept. of Interior, and Treasury.

There are also agencies that are not particularly complex either politically or technically, but produce output that is particularly hard to measure. This includes State, DOD, and Dept. of Justice. My expectation is that these agencies have considerable discretion, because it is costly to monitor agencies where both outputs and outcomes are not readily apparent (Horn, 1995). Consistent with this expectation, Epstein's and O'Halloran's (1999) discretion scores for committees overseeing these agencies are relatively high (40%, compared to the mean of 28%).

My coding scheme is exhaustive[8] but it is purposely not mutually exclusive. For example, the DOD and its Armed Service components (which the survey codes separately) pursue technically complex activities whose output is hard to measure. I code the DOD and each of its components as 1 on the technical complexity indicator, and as 1 on the output-hard-to-measure indicator. Both indicators predict high agency discretion, but for different reasons. Using indicators that are not mutually exclusive captures the ambiguity of the signals from the external political environment of federal agencies. Similarly, the FAA is technically complex, but it is also a regulatory agency. Treasury includes IRS, which is low in technical complexity, but the agency also has regulatory responsibilities, and it is coded accordingly on both indicators.

Monitors, Distance, and Confusion

In addition to variation in Congressional oversight, employees face oversight from the President and from internal managers. Oversight from the Chief Executive is implemented by political appointees. I collected information on the number of political appointees in each agency from The Plum Book (U. S. Congress, 2000). (United States Government Policy and Supporting Positions: 2000 edition; U.S., Congress, Committee

[8] I also constructed a separate dummy variable for a key determinant of agency discretion: political disagreement. Because of their monopoly on information, I coded the defense and foreign policy agencies as 1, indicating (relative) political agreement among the legislature, compared to the domestic policy agencies, coded 0. Some formal theory (e.g., Moe, 1990; Scholz, 1991) suggests that political agreement should increase discretion, and the Epstein-O'Halloran scores confirm that expectation: the mean discretion score for DOD, Army, Navy, Air Force and State Department is 45%, compared to the mean of 28%. Including this dummy variable in the estimates reported in Tables 2 and 3 below show that the variable is never significant, and is collinear with the other dummy variables. (For example, the defense agencies are technically complex, and these agencies all have output that is hard to measure.) I therefore omit it from the reported results. Aside from collinearity, disagreement among principals is still reflected

on Governmental Affairs, U.S. Senate, 106th Congress, 2nd Session.) There are more political appointees in agencies whose output is hard to measure (77, compared to an average of 30). Using the Epstein-O'Halloran score, we also saw that these agencies also have more legislative discretion. Technical agencies also have a lot of discretion, but they do not have more political appointees than non-technical agencies (8, compared to the average of 30). Regulatory agencies, which have a rather technical task, have fewer political appointees (mean=17) than non-regulatory agencies (mean = 38). Agencies whose output is hard to measure have an average of 76 political appointees, compared to agencies whose output I deemed as relatively less hard to measure (14 political appointees). State department has the highest number of political appointees (202), while the FAA has 2 and NASA has 4. I note that the Air Force and Navy have 7 each, and the Army has 8 political appointees; these agencies have output that is, in the long run, hard to measure, which implies they should have many political overseers. However, they are also fundamentally technical agencies manned by engineers, whose production of outputs (not outcomes) is easy to measure. The remainder of DOD also has output that is hard to measure, but also has a policy-making role, and may be less technical; it has 22 political appointees. Controlling for agency size, I expect that the (overlapping) agency type indicators, and other variables, greater numbers of political appointees will reduce both employee discretion and productivity (Gilmour and Lewis, 2006).

Career supervisors also monitor employees. Career supervisors may clarify employee tasks, and give employees discretion to carry out the task, resulting in greater (or lesser) employee productivity. On the other hand, it is also possible for career supervisors to tie the hands of employees and to make them more (or less) productive. I measure the impact of career supervisors using the MSPB survey. The survey asked respondents whether they are supervisors. For each agency, I divided the number of respondents who said they are supervisors by the total number of respondents from that agency, and created a percentage. My basic expectation is that, on the average, career supervisors will have precisely the opposite effects of political appointees.[9]

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in characteristics that I do measure, such as number of political appointees, the employee's understanding of what she is to do, and how her job relates to the agency mission.

[9] I intentionally measure political appointees as numbers and career supervisors as percents. Political appointees communicate "messages" about agency mission; the messages are jointly consumed. The more

For a variety of reasons discussed in the previous section, employee discretion and productivity are both likely to decrease as the distance between the employee and her multiple principals increases. I use two proxies for the distance between employee and principals. One is agency size; there will be more paths between an employee and any one principal in large than small agencies. Data on the total number of employees in each agency came from The U.S. Government Manual (U.S. Government Printing Office, 2000-2001 Edition). The other proxy is the number of pages that pertain to each agency in The Plum Book (U.S., Congress, 2000). That book lists top administrators in each agency subunit; independent of agency size, agencies with more subunits have more pages of listings in The Plum Book. My expectation is that, along with agency size, employees in agencies with more subunits have less direct communication with agency principals, and will report less discretion and lower productivity.

In the presence of multiple principals, and independent of distance or agency size, uncertainty about principals' preferences is expected to reduce an employee's understanding of what they are to do, and how their job relates to the agency mission. I expect that this uncertainty to reduce both discretion and productivity. I measure job uncertainty by the response to the statement: "I know what is expected of me on the job." Observed responses range from 1 (low understanding) to 5 (high understanding), with intermediate scores between these anchors. The mean response is fairly high (4.0), and the standard deviation is 0.9. I measure the clarity of the link between the respondent's job and the agency mission with the response to the following item: "My performance standards are clearly linked to my organization's goals and objectives". The observed responses range from 1 (an unclear link) to 5 (a clear link), with intermediate scores between these two extremes. The mean response to this survey item is 3.3, and the standard deviation is 1.1.

Type of motivation: intrinsic and extrinsic rewards

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political appointees there are, the louder the message. Thus, their absolute number is important, not their relative proportions. In contrast, career supervisors directly monitor the work of individual agency employees. For them to be effective, their presence, relative to the number of workers, is the appropriate measure. I also include agency size as a separate control variable.

Motivation pertains to the reason that people do something. It is not directly observable, and reports of motivation may not reflect "true" motivation. In the tradition of principal-agent theory, motivation is inferred by revealed behavior. For example, if more pay leads employees to work harder, then the inference is that money is an extrinsic "motivator" or reward. If more control over their work leads employees to work harder, then the inference is that discretion is an intrinsic "motivator" or reward.[10] I assume that employees want more of both, and that employees in cross-section equilibrium (such as the respondents in this survey) are generally satisfied with the mix of their current level of pay and discretion, given the feasible alternatives. Those who are most unhappy will have left. Those who remain receive the maximum feasible sum of discretion and pay. The average worker is satisfied, and more satisfied with their job than their pay. In the data, average job satisfaction is 3.51 on a 1-5 scale, and average pay satisfaction is 3.10. However, employees are quite heterogeneous: some are happier with their pay (extrinsic reward) than their job control (intrinsic reward), while others are happier with the control they have over their activities than with their pay. With respect to working hard (i.e., productivity or performance), discretion matters, but the impact of discretion on productivity depends on why people work.

With respect to why federal employees do their work, I measure the relative value of intrinsic to extrinsic reward by subtracting two scores. The first score (intrinsic rewards) is the response to the question about job satisfaction: "In general, I am satisfied with my job." The second score (extrinsic rewards) is the response to the question about pay: "Overall, I am satisfied with my current pay." Responses to both items ranged from 1 to 5, with 5 indicating the highest levels of satisfaction. Relative intrinsic value is indicated by the difference between these responses. The potential (and actual) range of responses is between -4 (mostly motivated by money) and +4 (mostly motivated by the work). The mean is 0.4, and the standard deviation is 1.3.

It is important to assess the construct validity of this measure of relative intrinsic value. I first show that satisfaction with the job is not the same as satisfaction with pay, and that they are each related to (different) variables that they should be related to. I then

[10] Deci and Ryan (2000) connect intrinsic motivation with both autonomy and competence. It is intrinsically more rewarding to be un-coerced, but also to be a skilled performer than a mediocre one.

establish that the difference between the two scores (relative intrinsic value) behaves as it is expected to in terms of other closely related independent variables in the theoretical model.

With respect to the variables considered separately, job and pay satisfaction are only weakly correlated with each other in the sample (r = .31). In my conception of these measures, pay satisfaction should be more highly correlated with objective indicators of the respondent's salary than job satisfaction is, and that is the case. While the survey does not record actual pay, it does record the GS level. While the correlation between satisfaction with pay and GS level is not high (r=.23), it is higher than the correlation between satisfaction with job and GS level (r=.06). Among the GS levels, the highest mean level of job satisfaction is 3.7, recorded for GS-15 employees, while the lowest level is not much smaller, at 3.25 among the 24 GS 1-3 respondents. By contrast, the highest mean level of pay satisfaction is 3.5, also recorded by GS-15 respondents, but only 2.6 among the GS 1-3 respondents. While the mean respondent in no pay level is overwhelmingly pleased with the job or the pay, levels of satisfaction with pay appear predictably lower among those who actually receive lower pay.

Similarly, my conception of these measures predicts that job satisfaction will be more correlated with personal discretion than pay satisfaction will be. The observed correlations uphold this expectation: the correlation between discretion and job satisfaction is .55, while that between discretion and pay satisfaction is only .20.

Further, the measure of job ("intrinsic") satisfaction relative to pay ("extrinsic") satisfaction should be related to discretion, and not to pay. If I regress the difference score on personal discretion, pay level and pay type (wage, GS, or SES schedule), I find that personal discretion significantly increases relative satisfaction, while pay level and pay type reduce it. Using beta weights, the discretion score is the most "important" influence (beta = .28) while pay level is less important and negative (beta = -.18); the type of pay schedule is significant, and negative, but not of substantive importance (except for the fact that it, too, is negative). (Table not shown.)

There is additional support for the proposition that actual pay is more likely to drive satisfaction with pay, compared to personal discretion, while the reverse is true for job satisfaction. If I regress pay satisfaction on objective indicators of actual pay (GS

level and type of pay schedule), reported discretion, and education (an indicator of possible other employment opportunities outside the current job), a higher grade contributes to more pay satisfaction, and so does more job control; education reduces pay satisfaction (top panel, Table 1). The beta weights indicate that objective pay (GS level) is more important than job control (.27 vs. .17). Next, regressing job satisfaction on the same variables shows that one indicator of objective pay (GS level) raises job satisfaction, while those in the higher pay schedules report less job satisfaction (middle panel, Table 1). Education continues to have a negative effect. Most importantly, job control raises job satisfaction, and the beta weights indicate that its relative importance dominates the objective pay indicators (.55 vs. .05). Finally, if I regress the difference between job and pay satisfaction (relative intrinsic satisfaction) on these same variables, the results show that job control predictably increases it, while pay levels predictably decrease it; both are about equally important, since the sum of the negative beta weights for pay is -.23 and the positive beta weight for job control is .28 (bottom panel, Table 1). Education is now positive, suggesting that, all things considered, education raises relative satisfaction.

The theoretical expectation is that paying people (extrinsic rewards) for what they would otherwise want to do (intrinsic rewards) may actually reduce their output. Intrinsically motivated (or satisfied) employees (those whose score on relative intrinsic value is greater than zero) will use their discretion to increase output. For these people, more discretion combined with more intrinsic value is expected to raise productivity. Thus I multiply discretion scores (which can range from 3 to 15) by positive intrinsic value scores to measure the impact of norms for this intrinsically motivated group. Those whose relative intrinsic satisfaction is zero or negative are all coded as zero on this interactive term, whose values range from 0 to 60.

Employees in the extrinsically motivated (or satisfied) group (with negative scores on relative intrinsic satisfaction) are expected to use discretion to do nothing, to reduce quality, or to busy themselves with work that is unrelated to the agency mission. Once again, I multiply the discretion scores for these employees (ranging from 3 to 15) by their relative intrinsic satisfaction scores (which are all negative), producing a second interaction term that ranges from a low of -52 to a high of 0. For this group, as the scores go from very low to a high of 0, output should also increase. Another way of looking at

the same thing is that, for this group, discretion and relative extrinsic rewards (the lowest negative scores) reduce productivity. If these expectations are true, the implication is that giving discretion to intrinsically motivated (or satisfied) employees makes them more productive (using the 3-component measure), while giving discretion to extrinsically motivated (or satisfied) employees makes them less productive. This would be consistent with Miller's (2000) expectation that selection (based on values) trumps moral hazard (based on pay).

These two interactive variables appear only in the equation for productivity (equation 2). Recall also that the measure of discretion used to estimate its impact on productivity is the value estimated from equation (1). Thus, I created the two interactive terms first by multiplying the estimated value of discretion (Y1-hat) times the positive intrinsic value scale score, and then times the negative intrinsic value (i.e., extrinsic value) scale score.[11]

Control Variables

There are many control variables. Most, but not all, appear in both equations. For example, a workgroup's productivity is likely to affect how hard an employee in that group works (employee output), but not the employee's own discretion. Just as I measure the respondent's own level of performance by multiplying the respondent's assessment of her own productivity by her assessment of the quality of her work, I measure the respondent's assessment of her work group's performance in a similar manner. The MSPB survey asked respondents to rate the overall productivity of their work unit on a 10-point scale, from "not at all productive" (1) to "extremely productive" (10). The survey next asked respondents to rate the quality of work performed by their work unit as a whole on a 1-5 scale from "poor" (1) to "outstanding" (5). The level of performance of the work group is the (adjusted) sum of these two indicators. To make the responses to both of the questions numerically equivalent, I divided the response to the 10-point workgroup productivity scale by two, and then summed the two indicators. The mean

[11] I also used the observed value of Y1 to create these interaction terms. The results do not differ from those reported, but the standard errors are larger.

score on this 10-point scale is 7.69, with a standard deviation of 1.42, and a range of 1.5 to 10, which is the maximum possible range.

Another aspect of the respondent's work group may affect her level of performance and may also be related to how much discretion the agency has. Specifically, respondents in work groups that have high levels of cooperative behavior could have high levels of discretion and performance if they also cooperate (Thompson, 2005). It is also possible that respondents could free ride, so that very high levels of cooperation in the work group allow the respondent to slack off. The MSPB survey asked each respondent how much he agreed, on a 1-5 scale, with the statement, "A spirit of cooperation and teamwork exists in my work unit." The average response is 3.4 (standard deviation = 1.2), and the observed range of responses is from 1 to 5.

The size of the respondent's work group is also important, for two reasons. First, workgroup size is an indicator of possible scale economies (or diseconomies), implying that size affects employee productivity. Workgroup size may also affect employee discretion. Larger workgroups offer more opportunities for less peer supervision and more free-riding. Second, the inverse of the square of workgroup size is a measure of opportunities for cooperative behavior that may facilitate productivity.[12] The squared term appears only in the productivity equation. The mean work group has 22.5 employees (s = 42.3); the observed range is from 1 to 999, which is the maximum permissible response, and may indicate that a few employees confused their workgroup with their entire agency.

Other variables measuring personal characteristics also need to be controlled for statistical reasons. For example, supervisors (=1) have higher levels of pay. Assuming that pay is positively, if imperfectly, related to past performance, supervisors are likely to report higher levels of current performance and they are likely to have more discretion. 24% of the respondents are supervisors.

Years of experience with the federal government, and its square, must also be controlled. For several reasons, new federal government employees may have less

[12] As workgroup size increases, the probability that two persons will have repeated interactions within a fixed period of time decreases. If interactions are random, then 1/[N*(N-1)] is the probability that two persons in a group of N persons will bump into each other. Thus the square of N is a slightly inflated

discretion and may perform at lower levels. They may know less about their job; and they have had fewer repeated interactions with colleagues, and therefore may have less incentive to cooperate. At the other end of the scale, the most experienced federal employees may have the highest expertise and productivity, or they may have a lower level because the best employees leave. If so, then performance rises with years of experience up to a point, and then levels off or falls. The MSPB survey asked respondents to indicate the category of their years of experience. The categories were: <1; 1-5; 6-10; 11-15; 16-20; 21-25; 26-30; >31. I used the mid-point of these categories to make this an interval measure; I coded the last category as 32 years. The mean response is 18 years (s=8.7); the observed range is from .5 to 32 years of experience.

I also controlled for the worker's grade in the federal service. Presumably, higher paid, and thus higher grade, workers have higher levels of performance. They may also have higher levels and broader spans of authority and consequently more discretion. Grades range from 1 to 16. The mean grade is 11.5 (s = 2.67); the observed range is from 1 to 16.

However, pay grades cannot be examined independently of the type of pay system, which I score as a 3-point ordinal scale. About 1% of workers are wage grade employees (=1). Compared to other federal workers, these employees are likely to have little discretion, and their jobs probably have output that is relatively traceable to individual effort. Workers in the very highest grade (16) are in the Senior Executive Service (=3). They are likely to have considerable discretion and are likely to rate their performance level at the highest levels. Most workers (82%) are in the general schedule (GS) system (=2).

Education is also an important statistical control. Because the federal pay system does not explicitly reward education, many relatively high grade workers (e.g., GS 15) may have less formal education than workers with lower pay grades, but it is possible that workers with more education have more discretion and report higher productivity, if grade levels do not capture these human capital differences. The MSPB survey measures education as a 7-point scale where 1 is less than a high school diploma; 2=high school or

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inverse indicator of this concept. In this study, then, the size of the group (and its square) is a proxy for two different ideas.

GED; 3=more than high school; 4=associates degree; 5= BA or BS; 6=more than BA or BS; 7= graduate degree. The sample mean (and median) is 5 (s=1.64). The observed range is from 1 to 7.

Finally, I also controlled for gender (women = 1) and minority status (=1) because protected classes of people may rate their own performance differently than others rate their own performance, and they may be given jobs with less discretion. 41% of the respondents are women, and 21% are minority.

Results

Table 2 displays the results for the impact of these variables on both discretion and performance. Consider first the sources of individual discretion. The type of agency matters; that is, the reason for discretion affects the impact of agency discretion on individual discretion. The task of regulatory agencies is somewhat complex, but the output of regulatory agencies is easy for regulated entities to monitor, and agency rulemaking activities are scrutinized by both interest groups and regulated entities. Similarly, the output of employees in client service agencies is easy to monitor ex ante and ex post, but their task is not particularly complex. Table 2 shows that employees in these agencies report significantly less discretion than comparable employees in other agencies. Employees in regulatory agencies report about .2 less discretion on the 13-point scale (ranging from 3 to 15), while employees in client service agencies report .4 less discretion. However, employees in agencies thought to have the most discretion (DOD and NASA, for example) do not appear to have distinctively more discretion than employees in other agencies.

Supervision affects discretion too. As expected, political supervision reduces individual discretion, while supervision by career staff increases it. Also as expected, individual discretion drops as agency size increases.

The clarity with which the employee's task is defined also increases discretion by about slightly more than 1/2 a point on the 13-point scale. Linking performance standards to agency goals also appears to augment employee discretion by about 3/4 point.

Many of the control variables affect employee discretion as well. Workgroup cooperation increases individual discretion by nearly 1 point. Supervisors report more discretion than the average employee, as do higher grade employees and employees in the GS and SES pay-types. Employees with more education report less discretion, once grade, pay-type, supervisory status, and years of experience are held constant.

With respect to performance, recall that individual performance is a subjective assessment, measured as the (adjusted) sum of quantity, quality, and mission-focus of work on a 15-point scale, with an observed range of 11 (scores from 5-15). The results suggest that discretion at both the agency and the individual level affects individual level performance, but in variegated ways. Employees in technical agencies report lower levels of output than comparable employees in other agencies, by about .3 point on the 11 point scale (Table 2), but these employees did not report more or less discretion than other employees. Individuals in agencies with hard-to-measure output report .7 more productivity than respondents in other types of agencies, but they also did not report any more or less discretion. Individuals in service agencies also report higher performance (by about .2 point), yet they report less discretion than workers in other types of agencies. Employees in regulatory agencies reported less discretion, but are not different with respect to productivity. Overall, there is no clear impact of top-level agency discretion on the discretion and the performance of individual employees in each agency; sometimes there is no association, sometimes the estimate of impact is positive, and sometimes it is negative.

Political appointees not only reduce employee discretion; they also reduce performance. The impact is significant, but seemingly not "large". Each additional political appointee reduces individual employee performance by .002 on the 11-point scale. However, summed over the 70,000 "average" employees in the average agency, this point estimate is "large." By contrast, career supervisors appear to expand discretion, but they have no significant direct effect on output. Nonetheless, they affect output indirectly because they do directly increase employee discretion.

Individual discretion also affects individual performance, but its impact depends on why people work. As discretion increases for intrinsically motivated (or satisfied) workers, productivity increases (by about .02 points on the 11-point scale). Discretion

for intrinsically motivated workers is measured on a multiplicative scale that ranges from 0 to 60; thus, a 10-point increase (about 17%) on the intrinsic-discretion scale increases productivity by .2 (almost 20%).

With respect to extrinsic motivation or satisfaction, as discretion increases and the level of extrinsic to intrinsic satisfaction increases also, the multiplicative score becomes increasingly negative, starting at 0 and dropping to -52. Like the coefficient for relative intrinsic motivation, the regression coefficient of performance on this scale is positive (.04) and significant, but the meaning is different. In this case, the positive coefficient means that those with the lowest scores on discretion-motivation have the lowest scores on the dependent variable too. Those with the highest discretion-motivation scores still have intrinsic motivation that is less than extrinsic motivation, but only slightly less, with a score that is negative, but only slightly less than 0. The parameter estimate means that, for a 10-point drop in motivation-discretion (that is, as extrinsic satisfaction increasingly exceeds intrinsic satisfaction), performance drops by .4. Thus, the regression coefficient appears positive and significant in both cases, but the quadrants are different. A positive association in the lower left quadrant implies that employees with high discretion whose extrinsic motivation most exceeds intrinsic motivation (a high negative value) report the lowest levels of output. For these employees, less discretion would improve productivity. Employees in the upper right positive quadrant report higher levels of intrinsic relative to extrinsic motivation. For these employees, more discretion increases output. Moreover, since the scale of the variables is roughly similar (0-60 for one scale, and -52 to 0 for the other), the magnitude of the coefficients is roughly comparable. The results imply that extrinsic rewards (pay satisfaction exceeds job satisfaction) depress performance almost twice as much as intrinsic reward improves it. This would suggest, just as Kreps (1990) and Frey (1994, 1997) find, that extrinsic rewards can crowd out intrinsic motivation and make performance worse.

Agency size (number of employees) and layering (pages in the Plum Book) appear to reduce output. However, persons who see their tasks as being clearly defined and clearly linked to the agency mission see themselves as more productive.

The control variables are also informative. Individuals may free-ride on the efforts of their co-workers, but group norms of productivity counteract these effects.

That is, respondents in cooperative workgroups are themselves less productive, but persons in productive workgroups are themselves more productive. Women report no significantly different performance levels than men, but minorities report higher performance levels.

The dependent variable reported in Table 2 aggregates three components of productivity: quantity, quality, and mission-orientation. Recall that the variable with the lowest loading on the productivity "factor" is the employee response to "contributing to the mission of the unit", and that that variable is least highly correlated with the other two. It would thus be informative to re-estimate equation (2) with mission-oriented productivity as the dependent variable alone.[13] Table 3 reports the results. Most of the results are similar to those reported in Table 2, including those with respect to the crowd-out of intrinsic by extrinsic motivation-discretion, but there are some exceptions. Women report poorer mission-oriented performance results than men, and so do respondents with more education. (Neither of these variables was significant in Table 2.) Most important, political appointees continue to reduce agency-mission oriented performance, but, in Table 3, career supervisors significantly increase it. (Recall that career supervisors had no significant effect on the 3-component index.)

Discussion

Overall, these results raise questions about the veracity of the common allegation, based on a simple construction of principal-agent theory, that employee discretion leads inevitably to shirking or sabotage. While this view is not dominant in the traditional public administration literature (Perry, 1990; Crewson, 1997), it is a critical assumption of the "new public management (NPM)." NPM strives to make government agencies more like the "private sector," which is assumed always to use money to reward performance that helps the organization. In fact, money in the private sector is used to reward performance primarily when performance is easy to monitor and measure (Baker, 2000). The results in this paper, framed in the language of principal-agent literature,

[13] Regressions with separate measures of quantity and quality produced the same results as those reported in Table 1, but with poorer fit and somewhat larger standard errors. This is expected since indexes (such as that constructed for the dependent variable in Table 1) usually are less noisy than each of their separate components.

suggest that intrinsic rewards also matter. Kreps (1994, 1997) and Frey (1990) show that this is true in the private sector. My results show that this is true also in the public sector. They provide empirical support for Miller's prediction (2000) that selection (or retention) "trumps" moral hazard. That is, giving discretion to employees who value their jobs more than the money appears to increase performance, while giving discretion to workers who value the money more than the job reduces performance. Principals and agents matter, but there are both multiple principals and principles, suggesting a more nuanced version of the traditional principal-agent model.

The results also raise questions about the impact of an important class of principals: political appointees. Political appointees, appointed to improve the ability of the elected chief executive to monitor federal agency employees, predictably reduce employee discretion. In a sense, then, political appointees are effective, since reducing employee discretion is what they are "supposed" to do. Because they reduce discretion, political appointees have an indirect, contingent effect on employee productivity. For extrinsically motivated employees, reduced discretion raises performance, giving political appointees more control. However, for intrinsically motivated employees, reduced discretion reduces performance.

Political appointees also have a direct negative effect on performance. We saw that the point estimate of the impact of a political appointee on the performance of an average employee is significant but not large. However, summed over an average agency of 70,000 employees, the impact of one additional political appointee on reducing agency performance would be quite large. No matter whether performance is measured as a three-component index, or as a single component (agency-mission performance), political appointees reduce performance. This suggests that political appointees may be very successful in securing executive control over agencies whose employees do not share the values of the executive. (It is telling that the defense department agencies have the fewest political appointees, while the agencies with more clearly "political" missions, such as Interior and Justice, have the most.) The opposite effects of political appointees and career supervisors on discretion and mission-oriented productivity, together with the contingent effect of discretion on output is consistent with evidence of a tradeoff between

political responsiveness, career management, and bureau output, as suggested by West (2005), Weimer (2005) and Krause, Lewis and Douglas (2006).

Does aggregate agency discretion matter? Does agency discretion make employees less accountable? The evidence suggests no simple relation. Employees in service agencies report both less discretion and more output. Employees in technical agencies and agencies where output is hard to measure report no differences in discretion, but employees in technical agencies report lower performance while those in agencies where output is hard to measure report higher performance levels. In most agencies, political supervision reduces discretion, and discretion has a contingent effect on output, depending on employee motivation. That is, when intrinsic motivation exceeds extrinsic motives, employees with more discretion report higher levels of productivity. When there is conflict about agency mission (agency vs. President vs. Congress), especially likely in non-technical agencies, it is possible that intrinsic rewards may work better to improve employee productivity. Overall, there appears to be a tradeoff between accountability (to the executive) and productivity: executive political controls reduce both discretion (presumably raising accountability) and productivity.

On the other hand, it may be that clear agency missions facilitate productivity, at least indirectly. At the employee level, it is clear that clarity of task and linking employee task to agency mission also raises both output and discretion.

The measures of discretion and productivity in this study raise issues of measurement validity. However, previous research (Langbein and Lewis, 1998) suggests that, at least for electrical engineers, reported performance correlates with pay in both the private and the public sector. In another study, reported discretion has construct validity (Langbein, 2000) in that it behaves they way it is expected to theoretically. Also, like other studies (Gilmour and Lewis, 2006; Krause, Lewis and Douglas, 2006), this study finds that political appointees reduce (agency) mission-oriented output, even though the measures of performance are quite different.

Goodness of fit statistics (results not shown) indicate that including discretion and motivation (intrinsic/extrinsic) as two separate variables is not better than those reported in Tables 2 and 3. Specifically, in a model in which discretion and motivation are entered into the productivity equation as two separate variables, discretion has no direct impact

on productivity, but motivation does. However, the interactive version (reported in Tables 2 and 3) has a better fit to the data, with a higher "R-square."

Typical of observational studies such as this one, these estimates may reflect omitted variable bias. One way to test for omitted agency-level characteristics is to compare the results in Tables 2 and 3 with those from a model that adds a dummy variable for each agency. As reported above (in footnote 7), using agency dummies does not increase the explanatory power of the estimating equations, does not change the key parameter estimates, and only serves to produce collinearity problems.

Simultaneity is another form of bias due to an omitted variable. The equations for individual productivity may reflect simultaneity, since it is possible not only that discretion affects performance, but good performers may be given more discretion. However, it is not clear theoretically that it matters whether the estimate of the relation between conditional discretion on productivity reflects one-way or two-way causation. Rather, the focus in this study is the conditional nature of the relationship between discretion and productivity.

In sum, the reported results appear robust to many model specifications. They suggest that external controls of federal agencies from both the legislature and the executive office of the President affect both the discretion and productivity of federal employees, but the impact is contingent on many other variables, particularly the employees' motivation. Employees who are motivated by liking their work more than their pay use their discretion to enhance productivity, while employees who are motivated by liking their pay more than their work use their discretion to reduce their productivity. That discretion increases productivity when employees are intrinsically motivated raises questions for future research about the probable effectiveness of pay for performance when employee performance is measured by political rather than professional career employees, especially when political appointees and career supervisors do not share a similar view of the agency mission. Under these circumstances, at least in the Federal public workplace, extrinsic reward in the absence of discretion may "crowd out" both intrinsic motives and employee productivity.

Table 1: Regression of pay satisfaction, job satisfaction, and relative satisfaction (job-pay) on grade, paytype, discretion and education (robust estimates of standard error).

	Dependent variable: Pay Satisfaction		
	Estimate	t-prob.	Beta
Independent variable			
Grade	.11	.000	.27
Paytype	-.04	.470	-.01
Discretion	.08	.000	.17
Education	-.08	.000	-.12

	Dependent variable: Job Satisfaction		
	Estimate	t-prob.	Beta
Independent variable			
Grade	.02	.000	.05
Paytype	-.18	.000	-.05
Discretion	.21	.000	.55
Education	-.05	.000	-.09

	Dependent variable: Relative (Job-Pay) Satisfaction		
	Estimate	t-prob.	Beta
Independent variable			
Grade	-.09	.000	-.20
Paytype	-.14	.032	-.03
Discretion	.13	.000	.28
Education	.03	.011	.04

Table 2: Regression of discretion and performance on agency type and other variables (robust standard errors, instrumented discretion in performance regression).

	Dependent variable			
	Individual discretion		Individual performance	
	Estimate	t-prob.	Estimate	t-prob.
Independent variables				
Constant	.70	.06	7.74	.000
MyDiscretHat*intrinsic	---	---	0.02	.000
MyDiscretHat*extrinsic	---	---	0.04	.000
Regulatory agency (=1)	-.19	.05	-.03	.67
Technical agency (=1)	-.11	.36	-.29	.002
Output hard to measure (=1)	.13	.48	.73	.000
Client service agency (=1)	-.37	.000	.19	.019
# political appointees	-.006	.000	-.002	.021
Pct. supervisors	.02	.000	.01	.24
# employees ('000s)	-.002	.007	-.002	.012
# pages in Plum Book	.004	.47	-.01	.026
Clarity of task	.59	.000	.25	.000
Reln of perf. std. to agency mission	.75	.000	.09	.003
Workgroup productivity	---	---	.44	.000
Workgroup cooperativeness	.82	.000	-.17	.000
Size of workgroup	-.001	.35	.00	.15
Size squared	---	---	-.00	.46
Supervisor (=1)	.34	.000	-.01	.88
Yrs. experience	-.02	.000	.01	.36
Yrs. squared	---	---	-.001	.05
Grade	0.08	.000	.06	.000
Paytype	0.35	.004	-.19	.052
Education	-.07	.002	-.00	.87
Gender (F=1)	.01	.91	.03	.59
Minority (=1)	-.04	.58	.23	.000
R2	.47		.24	
F-value	193		439	
P-value	.000		.000	
N observations	4229		3696	

Table 3: Regression of mission-oriented performance on agency type and other variables (robust standard errors, instrumented discretion from Table 1 discretion equation).

	Dependent variable Mission-performance	
	Estimate	t-prob.
Independent variables		
Constant	4.12	.000
MyDiscret*intrinsic	.02	.000
MyDiscret*extrinsic	.05	.000
Regulatory agency (=1)	.05	.59
Technical agency (=1)	-.28	.022
Output hard to measure (=1)	.70	.001
Client service agency (=1)	.23	.032
# political appointees	-.003	.003
Pct. supervisors	.02	.044
# employees ('000s)	-.002	.10
# pages in Plum Book	-.01	.02
Clarity of task	.24	.000
Reln of perf. std. to agency mission	.19	.000
Workgroup productivity	.25	.000
Workgroup cooperativeness	-.06	.08
Size of workgroup	.002	.20
Size squared	.000	.38
Supervisor (=1)	.09	.29
Yrs. experience	.01	.63
Yrs. squared	-.00	.16
Grade	.07	.000
Paytype	-.25	.037
Education	-.05	.036
Gender (F=1)	-.25	.001
Minority (=1)	.31	.000
R2	.13	
F-value	21	
P-value	.000	
N observations	3958	

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