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Using Data to Manage for Performance at Public Universities

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As performance-oriented reforms have become more commonplace in recent years, questions about the factors that drive organizational adoption and use of performance systems for internal management are of central importance. This article uses data taken from a survey of presidents at public universities to advance our understanding about the use of data and performance management strategies within public organizations. The central research question is, why do public administrators choose to employ performance management strategies? In addition, the author also explores variation in the extent to which public universities use performance management strategies for three tasks that are central to public management: (1) strategic planning, (2) evaluating employees, and (3) interacting with external stakeholders. Findings indicate that public universities often use performance data to help manage, but many of the causal factors that lead to data use vary across management functions.

As performance-oriented reforms have become more commonplace in recent years, questions about the factors that drive organizational adoption and use of performance systems for internal management are of central importance (Kroll 2012; Moynihan 2010). Despite the increasing prevalence of performance management within public agencies throughout government at all levels over the last couple of decades, there is still substantial variation in the extent to which organizations use data to inform decision making and improve management (Behn 2008; Julnes 2008; Kroll and Vogel 2013; Moynihan and Hawes 2012; Moynihan and Pandey 2010; Moynihan, Pandey, and Wright 2012a, 2012b; Poister, Pasha, and Edwards 2013; Pollitt 2006). This discussion about organizational use of performance data has recently become prominent within higher education policy, where there has been considerable effort to explore important questions about the ways that quantitative data and internal performance diagnostics can be employed to promote better student learning outcomes, contain rising costs and tuition increases, identify opportunities for external funding

from alumni and private donors, and be more effective in efforts to expand capacity for research and development (Coburn and Turner 2012; Colyvas 2012; Ewell 2011; McLaughlin and McLaughlin 2007; Weisbrod, Ballou, and Asch 2008).

Using data taken from a survey of presidents at public universities, this article makes several important contributions to the literature on performance management and information use within organizations. First, I explore the role of administrative values, and political ideology in particular, as a driver of performance management within public organizations. Despite the fact that performance management is often touted as a value-neutral reform that seeks to overcome and negate irrational decisions made through the political process, there is considerable evidence that, at least within the context of external accountability policies, ideological and partisan factors shape the way that actors use and interpret performance information (Dull 2006; Gilmour and Lewis 2006; Lavertu and Moynihan 2013; Moynihan 2006). This article extends this line of research to examine the impact of political ideology on performance management techniques within public organizations.

Second, I evaluate the extent to which external accountability policies, such as the performance funding policies that have been implemented in many states for institutions of higher education, influence administrative behavior with respect to performance information use. Despite the fact that many external policies are designed, at least in part, to prompt changes in administrative behavior, there is little evidence that these policies have had their desired effects (Melkers and Willoughby 2004; Radin 2006; Thurmaier and Willoughby 2001; U.S. Government Accountability Office 2005). I find that these concerns are valid with respect to performance funding policies, but it is unclear whether this is the result of failures in policy design and implementation or whether it suggests a failure in the underlying theory of these external accountability policies.

Third, I examine the extent to which information about organizational performance provides a feedback mechanism that shapes decisions about whether to invest in performance management systems and strategies. Increasingly, discussions of performance (particularly with respect to data-driven metrics of organizational outcomes) have taken center stage in the public sector, and this trend has important implications for the way we think about incentives that managers face in collecting and using data (Nielsen 2013). I find that information about organizational performance does, in fact, prompt managers to use data more extensively, although this seems to be linked primarily to the use of positive information for the purposes of external engagement rather than the pressures brought about by negative performance to invest more extensively in new managerial strategies.

Finally, I explore important nuances that exist in the predictors of performance information use for a variety of tasks. Given that much of the recent theoretical and conceptual research on performance information use has drawn distinctions in the multitude of purposes for which managers might use data (Behn 2003; Taylor 2009; Van Dooren, Bouckaert, and Halligan 2010), we might expect that the predictors of use will vary across management tasks. I find that there are indeed important differences in the reasons that managers use data for tasks such as employee evaluation and oversight compared to broad efforts to identify strengths and weaknesses and engage in strategic planning or efforts aimed at engaging external stakeholders to demonstrate value. These results suggest that future efforts to understand the adoption and implementation of performance management strategies will need to account for these nuances, particularly in policy areas in which agencies possess complex (and sometimes conflicting) goals.

Why Use Performance Management?

While research about external systems of accountability and performance-based budgeting has generally found these reforms to be ineffective (Bohte and Meier 2000; Brudney, Hebert, and Wright 1999; Hood 2006; Radin 2006; Ravitch 2010; Thurmaier and Willoughby 2001), scholarship about performance management within organizations is much more optimistic about the potential for performance information to generate positive outcomes and promote organizational learning (Behn 2006; Moynihan 2008). As organizations build routines and structures to analyze and discuss performance information, they not only enhance the capacity for managers to evaluate the performance of subordinates and to provide guidance or corrective action when needed, but also they build a culture that is oriented around learning and adaptation (Behn 2006). Further, Moynihan (2005) argues that when used effectively, performance management can lead to “double-loop” learning, which allows agencies to reevaluate key assumptions and values that underlie the central goals and mission of the organization. In doing so, public agencies are better positioned to identify breakdowns in both the design and causal logic of programs and policies and can help put forth alternative strategies for dealing with complex social problems that may be more effective.

While performance management can sometimes be useful, however, it also imposes nontrivial costs on individuals and organizations. These include both psychological and cognitive costs associated with using quantitative data as opposed to less formal and more

interpersonal sources of information to guide decision making (Behn 2002; Kroll and Vogel 2013), along with the material costs associated with designing and maintaining analytical systems to manage data collection and storage (Radin 2006). As a result of these costs, performance management has often been characterized as an underutilized strategy within the public sector (Barzelay 1992; Hatry 2006; Julnes and Holzer 2008; Keehley and Abercrombie 2008; Osborne and Gaebler 1992).

Thus, we can think of performance management as a type of investment, with both potential payoffs (in the form of improved information and enhanced capacity to learn and adapt) and potential costs (such as the effort associated with collecting and analyzing data or the potential for performance management to create hostility, distrust, or perverse incentives that undermine organizational culture). The key puzzle, then, is to understand why some organizations and managers choose to make this investment, while others do not.

Who Uses Performance Management?

In recent years, as scholars have become increasingly interested in developing a theory of performance information use, and as practitioners and policy makers have sought to encourage public organizations to employ performance management strategies, empirical research on the factors that drive the adoption and use of performance management has exploded in popularity. Kroll (2012) identifies at least 20 empirical studies of managerial use of performance information. Unfortunately, many of these studies have found conflicting results as to the relative importance of various factors, and it remains unclear whether these differences are attributable to variation in survey design or differences in the various policy areas that scholars have analyzed, or whether they are simply a result of measurement error. As a result, several scholars have called for additional research to further explore this topic (Ammons and Rivenbark 2008; Julnes 2008; Kroll 2012; Moynihan and Hawes 2012; Poister, Pasha, and Edwards 2013; Yang and Pandey 2009).

Conceptually, empirical research on performance information use has drawn on a number of theoretical frameworks, which have focused attention around three major forces that drive management practices: (1) external pressures from the political and social environment, (2) organizational pressures that either promote or inhibit change, and (3) personal values and traits that shape managerial preferences and perceptions about the value of performance information use. Although this work has made substantial progress in advancing an empirical research agenda to better understand performance management and its antecedents, there are several areas where theory can be strengthened and expanded.

Performance Funding Policies and Internal Use of Performance Information

From an external environment perspective, we can think about decisions regarding performance management as a function of principal-agent relationships in which performance and information asymmetries are central to efforts of managers to buffer their organizations against external influence (Moynihan 2010). Similarly, as external stakeholders seek to increase their ability to engage in oversight and control related activities, they promote performance management regimes that are designed to increase transparency and

accountability (Thomas 2001). Because performance information is used strategically by both managers and political actors, this principal-agent framework suggests that organizations will be more apt to engage in serious internal performance management efforts when the external environment is hostile or when external actors are better positioned to exert influence on public managers (Bourdeaux and Chikoto 2008; Moynihan and Hawes 2012; Yang and Hsieh 2007).

One aspect of this literature that has been underexamined is the relationship between external accountability regimes (and performance funding policies in particular) and the adoption of internal performance management techniques. While external performance regimes and internal performance management techniques are often treated as distinct concepts (Behn 2003; Julnes 2008; Moynihan 2008), there is also some reason to believe that these reforms may be linked to each other. Indeed, external accountability regimes are often designed to increase the use of performance-oriented reforms within organizations as a means to bring about change and improvement, which then serves (at least in theory) to strengthen support for the external accountability policy (Moynihan and Hawes 2012). For example, one of the major outcomes of the No Child Left Behind Act and other standardized test-oriented performance policies in K–12 education has been a dramatic shift in the extent to which school administrators have become active in seeking out ways to analyze and use a variety of data to improve performance (Moynihan and Hawes 2012; Spillane, Parise, and Sherer 2011; Strunk, McEachin, and Westover 2012).

On the other hand, considerable research about external accountability efforts suggests that these policies are often more symbolic than they are substantive and that they generally fail to transform internal management practices (Brudney, Hebert, and Wright 1999; Joyce and Thompkins 2002; Melkers and Willoughby 2005; Thurmaier and Willoughby 2001; U.S. Government Accountability Office 2005). In large part, this research suggests that external accountability policies are an ineffective form of control and that they can even drive some public managers to be reluctant to employ internally focused performance-oriented reforms (Franklin 2000). Thus, the effect of formal accountability policies on performance information use within organizations remains unclear.

Organizational Performance as a Motivator for Change

In thinking about the organizational context of performance management, there are also several useful theoretical lenses that we can draw on. Some scholars have thought about performance information use as a product of organizational culture, such that organizations that are open to change and experimentation are more likely to engage in a range of innovation-oriented efforts, including performance management (Moynihan 2008; Moynihan and Hawes 2012; Sanger 2008), while other work has focused on the analytical skill needed to engage in performance management, which highlights the importance of capacity building and investment in technological expertise (Berman and Wang 2000; Bourdeaux and Chikoto 2008; Yang and Hsieh 2007). One aspect of the organizational context that previous work has failed to seriously consider, however, is the importance of

information about organizational performance (such as benchmarks and indicators) as a motivator for change (Nielsen 2013).

While much of the work on performance management focuses on information as a key output that is generated by these systems, information about performance can also be thought of as an input that shapes the kinds of pressures that organizations face and the types of strategies that managers employ. In this context, information about performance provides important cues to organizations (and external stakeholders) about the extent to which they need to explore reforms and changes to try to improve outcomes, although

this relationship is likely to be complex. On the one hand, we might expect that poorly performing organizations will perceive a greater need to change and thus will be more likely to engage in performance management and performance information use. Indeed, this is part of the underlying logic for performance management in the first place—that organizations will use these data to make important improvements. On the other hand, organizations that are performing well could also increase use, particularly with regard to external engagement, as they would

have positive information to share with stakeholders. Thus, organizations might be spurred to invest more extensively in performance management both as a response to poor performance and as a way to capitalize on good performance within the context of external engagement.

Political Ideology and Preferences for Performance Management

Finally, we can also think about information use as a function of the personal traits, values, and characteristics of organizational leaders. Previous research has established that organizational leaders often have a tremendous amount of influence on the extent to which administrative reforms, such as performance management, are adopted and implemented within their organizations (Behn 2006; Dull 2009; Ingraham, Joyce, and Donahue 2003; Moynihan 2008). Given the important role that these actors play in shaping organizational culture, as well as their capacity to use routines and to allocate resources and rewards that incentivize employee behavior, their values and preferences can be a critical element of internal performance management systems. Until very recently however, there has been very little systematic and empirical work to evaluate the impact of these personal beliefs on information use (Kroll 2012).

Much of the existing work on managerial values has focused on theories such as public service motivation (Kroll and Vogel 2013; Moynihan, Pandey, and Wright 2012a) and transformational leadership (Moynihan, Pandey, and Wright 2012b; Wright and Pandey 2010) to explain leadership and its impact on performance management. While this research is important, we should note that other broad types of values and worldviews are also potentially important. One such value is political ideology, which previous research has often been found to be important for a wide range of administrative decisions and a significant predictor of perceptions and experiences with external performance accountability regimes (Gilmour and Lewis 2006; Lavertu and Moynihan 2013; Moynihan and Lavertu

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2012). Despite the fact that performance management is often touted as a value-neutral, “good government” reform, considerable evidence suggests that these reforms have their roots ideological doctrines, such as New Public Management, that highlight the value of market-like mechanisms of competition alongside efficiency and results oriented management (Moynihan 2008; Radin 2006). Because these values are often associated with conservative political movements to privatize government services (Box et al. 2001; McLendon, Hearn, and Deaton 2006; Radin 2006), performance management has taken on a political valence that has the potential to dramatically shape the ways that leaders within public organizations approach these types of reforms.

Performance Information Use as a Multidimensional Concept

In thinking about performance management and information use, several scholars have suggested that these concepts are nuanced and that there are a multitude of tasks that such approaches can be applied to. For example, Behn (2003) identifies eight purposes for performance management. These include efforts aimed at improving evaluation of program effectiveness, recognizing and celebrating successes, control over subordinates, budgeting, employee motivation, external engagement and demonstration of value to stakeholders, and tasks related to learning and organizational improvement. Van Dooren, Bouckaert, and Halligan (2010) condense this list and argue that there are three main ways that performance information can be used: (1) for learning, (2) for steering and control, and (3) for giving account to external stakeholders. The fact that performance management relates to such a broad array of administrative tasks suggests that decisions about using these strategies will be complex and contextual.

With a few notable exceptions (Moynihan and Hawes 2012; Moynihan and Lavertu 2012; Taylor 2009), however, much of the existing empirical research has operationalized performance information use as a single concept rather than as a strategy that managers might be more or less likely to employ for various purposes. While not unreasonable from a statistical standpoint—many studies (e.g., Kroll and Vogel 2013; Julnes and Holzer 2001; Moynihan, Pandey, and Wright 2012a) have found that responses about various dimensions of performance information use load reliably onto a single dimension—this approach limits our ability to understand subtle but potentially important nuances in the ways that managers use data for a variety of purposes.

For example, one might expect the factors that lead an organization to employ performance management with respect to learning and change to differ, at least somewhat, from the factors that drive decisions about using performance information and data to assess employees or engage external stakeholders about organizational productivity. Indeed, Taylor (2009) finds that organizations are much more likely to use performance information for external engagement than they are for internal learning and change, and the propensity to use performance information for external purposes is not related to the likelihood of using data for internal management. Similarly, the

kinds of factors that predict broad efforts to identify strengths and weaknesses and to regularly assess organizational performance might differ in important ways from the factors that predict more targeted tasks, such as evaluating the performance of employees. In organizations such as public colleges and universities, which have a large number of broad and somewhat ambiguous goals related to tasks ranging from undergraduate instruction, to research and scientific discovery, to public service and community involvement (Cohen and March 1986), these nuances may be particularly relevant.

Using Data for Performance at U.S. Public Universities

This article focuses on institutions of higher education to examine questions related to data use. Higher education is a useful area to study performance information use, for a couple of reasons.

Because higher education involves a complex assortment of goals and activities, designing adequate outcome measures that are valid and reliably capture the multifaceted nature of performance in higher education performance is not as straightforward as we have seen in some other policy areas, such as transportation, where it is perhaps easier to identify and isolate appropriate metrics of organizational performance (Poister, Pasha, and Edwards 2013). Further, as state budgets have become constrained in recent years and appropriations to public universities have fallen, many

institutions have very few slack resources to devote to new programs and management systems.

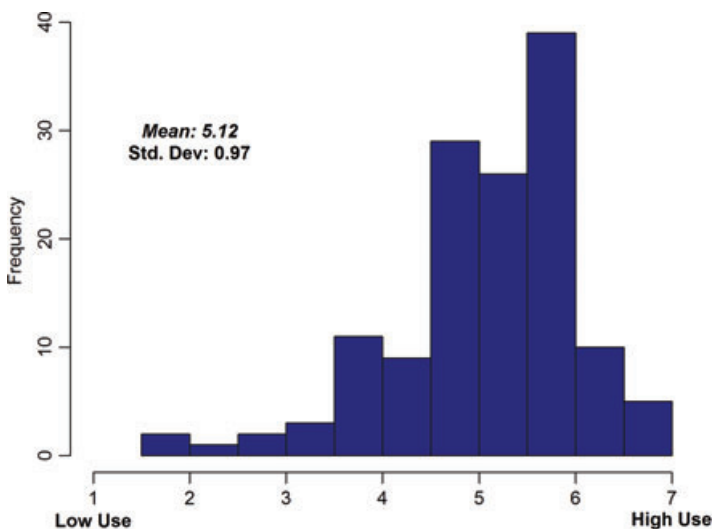
In terms of organizational culture, universities have traditionally seen themselves as complex organizations that are responsible for more than vocational training, and this makes issues related to quantified measurement of performance complicated. Many of the things that universities seek to do for students, such as encouraging long-term personal development and exposing them to new ideas, experiences, and perspectives, are difficult, if not impossible, to quantify. Further, as the external political environment has become increasingly hostile to higher education, faculty and staff often perceive these data systems as an attempt by university administrators to encroach on their autonomy and expertise, which can create a dysfunctional environment characterized by fear and mistrust rather than learning and adaptation (Ewell 2011). Thus, several questions remain about both the extent and effectiveness of performance information use within public universities (Coburn and Turner 2012; Colyvas 2012; Ewell 2011).

The data for this article come from a variety of sources. Most notably, this article uses a unique survey of presidents at public universities. Surveys were administered by mail after the 2011–12 academic school year to all public institutions that were classified as bachelor’s degree granting or higher according to the 2010 Carnegie classification scheme. Of the 558 institutions that met this criteria, 138 presidents answered the survey, yielding a response rate of 24.7 percent.¹ The instrument contained a series of items aimed at understanding the extent to which public universities employ performance management strategies and use performance data to guide decisions and improve performance. More specifically, the survey asked respondents to assess their institution’s use of performance data for

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Table 1 Summary Statistics

	Mean	SD	Min.	Max.
Factor: Data use	0	1	-3.94	1.92
Faculty teaching	4.96	1.56	1	7
Faculty research	4.72	1.63	1	7
Schedules/routines	4.88	1.54	1	7
Evaluate deans	4.91	1.44	1	7
Identify weaknesses	5.64	1.16	1	7
Stakeholder engagement	5.23	1.29	1	7
Oversee employees	4.92	1.18	1	7
Improve decisions	5.66	1.08	1	7
Performance funding policy	0.14	0.35	0	1
Funding depends on performance	2.64	2.34	0	8
Volatility of state appropriations	5.01	1.54	1	7
Influence of state political actors	4.70	2.17	0	10
Governing board structure	0.28	0.45	0	1
% of legislators Democrats	55.16	13.79	11.43	94.66
Factor: Limited organizational capacity for PM	0	1	-2.18	2.07
Research (Carnegie)	0.30	0.46	0	1
Graduation rates (latest available info)	43.84	16.18	1.93	100
Δ Graduation rates	0.53	4.94	-73.64	67.92
Total enrollment (1,000s)	11.20	9.95	0.18	72.25
Total revenues (logged)	18.29	1.29	13.23	22.64
Political conservatism	2.77	0.93	1	5
White	0.01	0.09	0	1
Experience	5.91	4.54	0.17	21

**Figure 1** Use of Performance Data at Public Universities

tasks ranging from the evaluation of teaching and research ability of faculty and instructors, to identifying organizational strengths, to engaging external stakeholders about the value produced by the university. Appendix B provides information about item wording, while summary statistics for each item (along with all other dependent and independent variables) can be found in table 1.

Overall, presidents at public universities indicate a relatively strong commitment to performance management. Across the nine items that were included in the survey (each of which was measured on a seven-point scale, where 1 = strongly disagree and 7 = strongly agree), mean responses ranged from a high of 5.66 ("My institution uses data to improve overall decision making") to a low of 4.72 ("My university uses performance data to track and assess the research productivity of faculty and instructors within each department"). Even for the lowest-rated item (assessing research ability of

faculty), more than 64 percent of respondents answered with a 5 or above.

To get a better sense of the distribution of responses about performance data use, figure 1 illustrates a histogram for an index (Cronbach's $\alpha = .822$) that was created from the aforementioned items (mean = 5.12). While the reliability of this index suggests that performance management can reasonably be operationalized as a single concept, as much of the previous literature has done, it is also important to note that there are notable theoretical reasons to suspect that the causal factors influencing each form of use might differ somewhat (Behn 2003). Thus, I examine both factors that predict use of performance data in the aggregate (using a factor score created from all of the aforementioned items), as well as disaggregated by task (using each of the nine individual items as a separate dependent variable).²

Predictors of Performance Data Use

As previously discussed, there has been a substantial increase in the number of empirical studies on performance management and performance information use in recent years, and this work has largely focused on three clusters of variables: (1) those from the external environment (policy context, political and bureaucratic oversight, and economic/fiscal situation), (2) variables dealing with the internal organizational climate (organizational capacity, mission), and (3) leadership characteristics (managerial values, demographics, and experience). My analysis follows this trend.

External Environment: Accountability, Oversight, and Funding Instability

Over the last several decades, higher education policy has witnessed a substantial shift in the relationship between state governments and public universities. Increasingly, state governments are demanding that public institutions be accountable for performance related to things such as research productivity, student outcomes, and cost efficiency (Zumeta 2004). One manifestation of this heightened focus on accountability has been the adoption of performance funding policies that seek to directly link institutional funding to organizational performance (Burke 2002). From a political control perspective, these external accountability systems provide an important mechanism for state governments that are attempting to influence the behavior of public managers (Meier and O'Toole 2006; Thomas 2001). Indeed, while these policies do not directly force institutions to alter their internal management practices, some have argued that, in addition to external accountability, they are often designed with a secondary purpose of pushing institutions toward greater use of performance management techniques (Dougherty and Reddy 2011; Ewell 1997, 2011).

I measure the strength of the performance regime in two ways. First, I employ a dichotomous variable to identify states that have adopted a formal performance funding policy. Institutions are coded as 1 if their state has a policy that explicitly links institutional performance with state appropriations, and 0 if their state has not adopted and implemented such a policy. Although this measure is somewhat limited in its capacity to pick up important variations in policy design between states, this variable has been used extensively in previous research on performance funding policies (Rabovsky 2012; Shin 2010; Volkwein and Tandberg

2008). Second, I also include a measure of perceptions about the extent to which institutional funding depends on performance.³ If external systems of performance-based accountability are effective at influencing organizational use of performance management, we should expect to find a positive relationship between the adoption of these systems and the use of performance data by public universities.

Hypothesis 1a: Public universities in states that have adopted performance funding policies will be more likely to use performance data for internal management.

Hypothesis 1b: When the university president perceives a stronger relationship between performance and state appropriations, public universities will be more likely to use performance data for internal management.

In addition to impacts on performance management that are directly related to the policy climate, characteristics of political principals can be an important predictor of information use. As political principals exert greater influence on the day-to-day management of public organizations, research has generally found, use of performance management increases (Ammons and Rivenbark 2008; Bourdeaux 2006; Bourdeaux and Chikoto 2008; Moynihan and Hawes 2012; Moynihan and Lavertu 2012). Given that public universities are largely accountable to state governments, I include a perceptual measure of the influence of state political actors, which was constructed by averaging responses to two items contained on the survey instrument that asked university presidents to rate (on a scale of 0–10) the influence of the state legislature and the influence of the governor on the way they manage their institutions.⁴ I also include the percentage of the state's legislators who are Democrats, to capture important effects that may be driven by partisanship. Given that much of the push for performance-based accountability has come from Republican-controlled legislatures (McLendon, Hearn, and Deaton 2006), I expect that performance information use will be *positively* related to the perceptual measure of state impact but *negatively* related to the percentage of legislators who are Democrats.

Hypothesis 2: Public universities will be more likely to use performance data when the university president perceives that political actors in their state have more influence.

Hypothesis 2a: Public universities will be less likely to use performance data when the state legislature has a higher percentage of Democrats.

Besides political actors who hold elected office, such as members of the state legislature and the governor, public universities must also be accountable to administrative bodies, such as regional accrediting agencies and statewide governing or coordinating boards. Within higher education policy research, the degree of centralization of the state's higher education governing and coordinating agencies has often been found to be important in understanding institutional behavior, particularly with respect to accountability relationships (Hearn and Griswold 1994; Knott and Payne 2004; Lowry 2001; McLendon, Hearn, and Deaton 2006; Nicholson-Crotty and Meier 2003; Richardson and Martinez 2009; Volkwein and Shaikat 1997;

Volkwein and Tandberg 2008). I control for administrative structure by including a dichotomous variable to indicate whether the state has a centralized governing board as opposed to a coordinating or planning agency. While I expect that governance structure matters, it is unclear whether greater centralization would be associated with higher or lower levels of use. On the one hand, we might expect that more centralized agencies would be more effective at exerting influence on universities than would noncentralized agencies, and thus governing boards would be associated with greater use of performance data (Nicholson-Crotty and Meier 2003). On the other hand, previous research on accountability in higher education has found that these centralized agencies often serve as a buffer against performance regimes, and thus they tend to dampen the role of data-driven accountability (McLendon, Hearn, and Deaton 2006). Further, given that these more centralized bodies often have more full-time and professional staff, it may be the case that they have enhanced capacity and expertise related to performance assessment, which could reduce the need for institutions to build their own systems.

Hypothesis 3a: Public universities in states with centralized governing boards will be more likely to use performance data.

Hypothesis 3b: Public universities in states with centralized governing boards will be less likely to use performance data.

Another form of regulatory oversight in higher education deals with the role of regional accrediting agencies. These agencies are responsible for periodically reviewing university practices and degree programs, and they have often been found to be influential in shaping university behavior (Spellings 2006). I also include a series of dichotomous variables to measure potential differences in performance data use across universities that report to various regional accrediting agencies, although I have no clear hypotheses about which regions will be more or less likely to use data.

Finally, a third variable from the external environment that may have an impact on organizational use of performance data is the uncertainty or volatility of important revenue streams. A long line of research in public administration has found that organizations in more unstable environments need to adopt flexible and adaptive structures and routines in order to cope with uncertainty and rapid change (Mintzberg 1979; Thompson 1967; Wilson 1989). Within higher education, one area of uncertainty that is likely to have a substantial impact on public universities relates to the stability of state appropriations. As state governments have increasingly played a reduced role in supporting institutions of higher learning, public universities have been forced to become more entrepreneurial and proactive in order to identify new streams of revenue and limit cost inefficiencies (Weisbrod, Ballou, and Asch 2008). Thus, we might expect that universities will be more open to incorporating performance data and other administrative reforms when the funding environment becomes more volatile. The survey asked presidents to rate the stability of state appropriations on a 1–7 scale, where 1 = very volatile and 7 = very stable. I have reverse-coded this question to create a measure of volatility in the external funding environment.

Hypothesis 4: Public universities will be more likely to use performance data when the external funding environment is more volatile.

Organizational Capacity and Performance

In terms of variables from the organizational environment, I focus on three key factors. First, I consider the impact of organizational capacity to collect and analyze performance data. As previously discussed, performance management imposes substantial costs on organizations. In order for performance data to be valid, reliable, timely, and useful for decision making, organizations must dedicate a significant amount of money, time, and staff toward developing systems capable of tracking, storing, and analyzing internal metrics of performance (Hatry 2006; Keehley and Abercrombie 2008; Pulakos 2009). In some cases, particularly when resources are limited and the capacity for administrative reform is constrained, these costs may be prohibitive (Berman and Wang 2000). In the case of public colleges and universities, among institutions that have faced serious budget cuts or are chronically underfunded and understaffed, we might expect that performance data use will be less prevalent because managers have few, if any, resources to dedicate toward building administrative capacity. I measure organizational capacity for performance management with an index of three items (Cronbach's $\alpha = .74$) taken from the survey.

It is difficult for my institution to fund systems (staff, computer databases, etc. . . .) that are dedicated to tracking and analyzing performance data.

There are other problems at my institution that we must address before we can worry about designing a new performance data system.

It has been difficult to figure out which indicators to measure and how to measure them.

Respondents were asked to rate whether they agreed or disagreed with the following statements (1 = strongly disagree to 7 = strongly agree), such that higher values indicate greater limitations in organizational capacity for performance management. In addition to this perceptual measure, I also include objective measures for organizational resources and in the form of the total revenue that an institution generated the previous year and total enrollment, both of which come from IPEDS (Integrated Postsecondary Education Data System).

Hypothesis 5: Public universities will be less likely to use performance data when they have limited resources and organizational capacity for creating performance management systems.

I also include a dichotomous variable for research universities to account for potentially important differences in organizational mission. Given that these institutions dedicate a substantial portion of time and resources toward the production of research and scientific knowledge, often with explicit the goal of improving their national ranking and prestige, we might expect that they not only will have a greater capacity to deal with the analytical costs associated with performance management, but also they will be more likely to see these types of data driven analytical efforts as useful, legitimate, and valuable.

Hypothesis 6: Research universities will be more likely to use performance data than will other public universities.

Third, I consider the importance of organizational performance as a potential motivator for change and improvement. For public

colleges and universities, the most salient indicator of performance, in terms of external accountability policies, is the institutional six-year (150 percent of normal time) graduation rate for full-time, first-time freshmen (Archibald and Feldman 2008; Dougherty and Reddy 2011; McLendon, Hearn, and Deaton 2006; Rabovsky 2012; Zhang 2009). This indicator is calculated as the proportion of students within a cohort that have earned a bachelor's degree within six years after enrolling in college for the first time. However, because I am interested in the information that policy makers and administrators have access to rather than the levels of performance that they are currently producing, I lag this variable by seven years from when the cohort enrolled (six years for the students to matriculate and an additional year for the data to be collected and reported). Thus, I employ graduation rates for the cohort that enrolled in the fall of 2004 as my primary measure of organizational performance. An additional advantage of using this lagged approach is that I am able to separate the information that policy makers have about performance from the process of generating said performance, which eases potential concerns about endogeneity. I expect that organizational performance should be *negatively* related to information use for the purposes of internally focused tasks such as employee evaluation and strategic planning but *positively* related to information use for external engagement.

In addition to this static measure of organizational performance, I also consider the possibility that recent changes in performance may drive decisions about information use. As Nielsen (2013) points out, managers may be more concerned with whether their organization is improving or declining than they are with how well they are performing presently. Thus, I include a measure for the year to year change in graduation rates from the 2003 to 2004 cohorts.

Hypothesis 7: Universities that have higher graduation rates will be less likely to use performance data for internally focused management tasks, but will be more likely to use information for external engagement.

Leadership Characteristics: Managerial Values, Experience, and Demographics

The final category of variables that I include focus on the personal characteristics of organizational leaders (in this case, university presidents). Organizational leaders have often been found to be highly influential in shaping the culture, routines, and practices of their agencies, and thus I expect that personal characteristics of these individuals will influence use of performance information within the organization (Bennis and Nanus 1985; Dull 2009; Kaufman 1960; Meier and O'Toole 2006; Moore 1995; Moynihan and Ingraham 2004). In thinking about the relevant personal characteristics for performance data use, I focus on three important factors: (1) political ideology, (2) experience, and (3) demographics.

With regard to ideology, I expect that political conservatism will be positively related to use of performance data. Just as performance management systems impose material costs on organizations, they also impose cognitive on individuals who must make decisions about which types of information are valid and reliable (Kroll and Vogel 2013). Given that the performance management movement has often taken on a politically conservative valence, particularly because of its association with New Public Management and

arguments related to privatization and market-based competition (Box 1999; Frederickson and Stazyk 2010; McLendon, Hearn, and Deaton 2006; Moynihan 2008; Pollitt 1993), I expect that leaders who identify as political conservatives will be more likely to embrace performance data as a tool for administrative reform, whereas political liberals will be less likely to do so.

Hypothesis 8: Public universities will be less likely to use performance data when the university president is politically conservative.

With respect to experience, previous research has found that more experienced managers are often better able to develop and use performance management strategies (Dull 2009; Folz, Abdelrazek, and Chung 2009; Ho 2006; Melkers and Willoughby 2005). I measure experience as the number of years that a respondent has been president at their current university. Additionally, some scholars have found that demographic characteristics play an important role in shaping managerial use of performance information, so I control for race, although I have no clear expectations about its impact on performance data use.⁵

Hypothesis 9: Public universities will be more likely to use performance data when the university president is more experienced.

Findings: General Use of Performance Data

Results from the analyses are presented in table 2.⁶ There are several noteworthy findings. Contrary to the expectations established by proponents of performance-based accountability, I do not find a positive relationship between use of performance data for internal management and the presence of an external performance funding policy. Indeed, when it comes to evaluating the research productivity of faculty members, performance funding policies seem to have a negative impact on the use of performance information. Given the findings of previous work on performance-based accountability (Fryar 2011; Sanford and Hunter 2010; Shin 2010; Shin and Milton 2004; Volkwein and Tandberg 2008), which largely suggest that these performance funding policies have been ineffective in a variety of areas and have often pushed institutions to shift resources away from research (Dougherty and Reddy 2011; Rabovsky 2012), this negative result is not necessarily unexpected.

Table 2 Use of Performance Data in Management

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Factor: Data Use	Faculty Teaching	Faculty Research	Evaluate Deans	Oversee Employees	Schedules/ Routines	Improve Decisions	Identify Weak	Regular Use	Stakeholder Engagement
External political and fiscal pressures										
Performance funding policy	-0.323 (-1.22)	-0.432 (-1.08)	-0.696* (-2.08)	-0.432 (-0.94)	-0.023 (-0.07)	-0.149 (-0.28)	-0.128 (-0.49)	-0.459 (-1.57)	-0.397 (-1.21)	-0.244 (-0.97)
Funding depends on performance	0.069+ (1.89)	0.062 (0.89)	0.012 (0.23)	0.136** (2.76)	0.065 (1.59)	0.052 (0.75)	0.009 (0.21)	0.046 (1.17)	0.098* (2.06)	0.116* (2.32)
Volatility of state funding	0.122+ (1.94)	0.130 (1.51)	0.090 (1.03)	0.046 (0.52)	0.173* (2.05)	0.130 (0.99)	0.118+ (1.81)	0.150+ (1.99)	0.092 (1.12)	0.083 (0.94)
Influence of state actors	0.064+ (1.80)	0.086 (1.60)	0.081 (1.43)	0.025 (0.33)	0.034 (0.96)	0.092 (1.40)	0.062 (1.28)	0.031 (0.65)	0.069+ (1.83)	0.091 (1.57)
Governing board structure	-0.554+ (-2.00)	-0.361 (-0.98)	-0.552+ (-1.84)	-0.261 (-0.62)	-0.448 (-1.50)	-0.416 (-0.97)	-0.857* (-2.63)	-0.560 (-1.67)	-0.648* (-2.52)	-0.432 (-1.23)
% of legislature Democrats	0.007 (0.65)	0.007 (0.46)	-0.003 (-0.27)	0.012 (0.87)	0.009 (0.71)	-0.014 (-0.99)	0.010 (0.83)	0.015 (1.36)	0.005 (0.51)	0.006 (0.57)
Organizational capacity and performance										
Limited organizational capacity	-0.154 (-1.67)	-0.272+ (-1.70)	0.090 (0.52)	-0.063 (-0.48)	-0.295** (-2.72)	0.027 (0.21)	-0.178 (-1.57)	-0.142 (-1.19)	-0.294* (-2.31)	-0.010 (-0.08)
Research (Carnegie)	-0.011 (-0.04)	0.462 (0.87)	0.618 (1.16)	-0.390 (-0.79)	-0.336 (-0.83)	-0.058 (-0.11)	-0.276 (-0.78)	0.382 (0.99)	-0.275 (-0.68)	0.112 (0.29)
Total enrollment (1,000s)	0.011 (0.44)	0.017 (0.67)	-0.011 (-0.41)	0.024 (0.80)	0.019 (0.74)	-0.018 (-0.56)	0.018 (0.65)	-0.013 (-0.48)	0.038 (1.38)	0.001 (0.04)
Total revenues (logged)	0.013 (0.05)	-0.352 (-1.10)	0.411 (1.11)	0.313 (0.95)	-0.083 (-0.29)	0.241 (0.60)	-0.037 (-0.13)	-0.005 (-0.02)	-0.174 (-0.61)	0.040 (0.13)
Graduation rates	0.018* (2.03)	0.022 (1.40)	0.014 (0.80)	0.000 (0.01)	0.023* (2.14)	0.027* (2.03)	0.009 (0.94)	0.016 (1.53)	0.018 (1.51)	0.029* (2.37)
Δ Graduation rates	-0.032 (-1.37)	0.006 (0.14)	-0.028 (-0.58)	-0.047 (-1.03)	-0.055 (-1.61)	-0.107* (-2.65)	0.011 (0.50)	-0.001 (-0.02)	-0.058 (-1.63)	-0.015 (-0.46)
Personal values and characteristics of organizational leaders										
Political conservatism	0.244* (2.69)	0.207 (1.42)	0.174 (1.13)	0.291+ (1.79)	0.308* (2.55)	0.148 (0.92)	0.215+ (1.76)	0.239* (2.06)	0.212+ (1.95)	0.261+ (1.72)
White	-0.414 (-1.50)	-0.178 (-0.38)	-0.126 (-0.48)	-0.232 (-0.43)	-0.336 (-1.14)	0.479 (1.47)	-0.722+ (-2.01)	-0.694* (-2.17)	-0.572 (-1.66)	-0.643* (-2.32)
Experience	0.029 (1.50)	0.016 (0.43)	0.074** (3.55)	0.036 (1.51)	0.023 (1.02)	0.060+ (1.80)	0.006 (0.24)	0.004 (0.16)	0.027 (1.38)	0.040 (1.42)
Constant	-2.891 (-0.73)	8.578 (1.60)	-4.542 (-0.71)	-2.934 (-0.51)	3.228 (0.65)	-2.638 (-0.39)	4.642 (1.01)	3.563 (0.69)	5.920 (1.32)	0.941 (0.18)
Observations	116	116	116	116	116	116	116	116	116	116
Adjusted R ²	0.286	0.024	0.204	0.084	0.258	0.079	0.228	0.190	0.251	0.191

+ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

t-statistics in parentheses; standard errors clustered by state.

Fixed effects for regional accrediting agency are included in each model but are not displayed.

While it is beyond the scope of this article to determine whether the ineffectiveness of performance funding is attributable to problems in policy design and implementation that are specific to the actual policies that have been adopted, as opposed to faulty causal logic regarding performance management as a general concept, it is important to note that we see no such negative relationship when looking at perceptions of the importance of funding. Indeed, the coefficient on perceptions of the importance of funding for performance is actually positive and statistically significant, and this result holds across most of the models. This gives some evidence that negative experiences with performance funding policies may be more related to issues of failed implementation and that future attempts at performance-based accountability might be more successful if these policies were designed and implemented in ways foster greater acceptance on the part of university administrators, although additional research is needed.

With regard to oversight and accreditation, I find that universities are more generally likely to use performance data when political actors (the legislature and governor) in their state are more influential, but they are less likely to do so when the state has a centralized governing board. Interestingly, however, these impacts differ substantially across the nine items. State political influence is only statistically significant for the overall factor and for the item regarding regular use of performance information, while governing boards are only significant for the aggregate factor, evaluating research of faculty, improving decisions, and regular use. Contrary to expectations, the partisanship of the state legislature is not statistically significant in any of the models. And finally, in terms of variables from the external environment, I find a positive relationship between volatility in the funding climate and the use of performance data, although these results are also inconsistent across the models. Fiscal instability an important predictor for the factor score as well as improving decisions and identifying weaknesses, but it is not significant in any of the other models. These results suggest that there are important nuances in the way that external political and fiscal conditions impact the use of performance information within public organizations.

In terms of the variables for organizational capacity and mission, I find that, as expected, organizations with greater limitations in their capacity to track and analyze data are less likely to use performance management, but this effect is only statistically significant for evaluation of teaching ability, oversight of employees, and regular use of performance information. This implies that when organizations have limited capacity for performance management and must make trade-offs between where to invest analytical resources, they may be more likely to shift their efforts toward activities aimed at external engagement and away from more inwardly focused activities, such as evaluating and overseeing employees.

With regard to organizational performance, I find that institutional graduation rates are positively linked to performance information use, particularly when it comes to general oversight of employees, the use of scheduled routines, and, most importantly, external engagement. Conversely, changes in graduation rates are only statistically significant when

it comes to the use of schedules and routines to analyze and collect performance data. These results suggest that information about positive performance spurs greater efforts at external engagement, but information about poor organizational performance is not associated with increased use of data for internally focused activities.

Finally, I find a positive relationship between the political conservatism of the organizational leader (i.e., the university president) and the use of performance data. This effect is generally consistent across the models and only fails to achieve statistical significance for evaluating teaching and research productivity of faculty and the use of schedules and routines to analyze performance data. Contrary to previous research, however, I find no consistent relationship between managerial experience and propensity to use performance information, although there is a positive effect between experience and evaluation of teaching capabilities as well as the use of schedules and routines. The fact that ideology and experience seem to mirror one another suggests that some elements of performance management may be driven more by personal values, while other kinds of tasks require advanced skills or experience that managers develop over time.

Discussion and Conclusion

Taken together, the findings from this article highlight a number of important implications for performance management and the use of data within public agencies. One particularly interesting finding is that organizational use of performance data is strongly related to the political ideology of agency leaders. Given that performance management reforms are often promoted as a value-neutral alternative to politics and partisanship, this finding has major implications for the way we think about these reforms. Rather than removing values or biases from the public sector, as proponents often claim, performance management instead appears to be vehicle through which personal preferences and predispositions of bureaucrats and organizational leaders can influence implementation.

One interesting question for future research is to explore whether this is related to underlying worldviews related to privatization and a preference for market-based mechanisms of competition and accountability (as much of the previous literature on performance management suggests), or whether it is instead related to political rhetoric and partisan debates about these techniques that have colored the way people think about data-driven management. Are conservatives more likely to use data because performance management is largely consistent with an underlying worldview, or is this instead related to cues they receive from other political elites? A potential way to get at this question would be to explore differences in propensity to use data that speak to various values and definitions of performance (e.g., equity versus efficiency), particularly as this relates to the broad worldviews and normative values for various actors within the political system. Thus, while this article focused on differential use according to tasks or activities, it is important that future work also think about the role that the content and design of performance metrics and data might play in shaping use.

I find little evidence that formal accountability mechanisms are effective at improving performance management use within organizations.

Relatedly, I find little evidence that formal accountability mechanisms are effective at

improving performance management use within organizations. As previously discussed, it remains an open question whether this is the result of poor policy design and implementation or whether there are inherent limitations in the capacity for these types of external efforts to shape administrative behavior. This article is somewhat limited in its ability to parse out these differences because of the way that performance funding policies have been coded, but the fact that perceptions about the importance of performance for funding are, in fact, positively related to information use suggests that questions regarding design and implementation would be important topics for future research. This is particularly important given the rise of new performance funding policies, which some have called “Performance Funding 2.0” (Dougherty and Reddy 2011), that might differ in important ways from older accountability efforts. More generally, if external policy makers hope to influence administrative use of performance information, they will need to pay close attention to both the objective bonuses and penalties that their policies impose for performance, as well as the subjective ways that administrative actors perceive these efforts.

Another potential limitation of this study is that I use survey responses from a single individual within the organization (the organizational leader) to assess the extent of use throughout their institution. While this approach has several benefits, particularly given the prominent role that organizational leaders play in shaping administrative reforms and organizational change, it also limits the ability to look at differences that may exist within the organization (particularly if the organizational leader is not well informed about these differences). Indeed, it may be the case that information use varies dramatically, not only in terms of managerial tasks that information is used for but also within various the departments and units. In the higher education context, for example, there might be important differences across academic units that are tied to preferences and resources controlled by deans, department heads/chairs, and other mid-level administrators. Future research could explore this possibility by collecting data from multiple individuals within the same organization.

As performance management has become increasingly prevalent within the public sector, questions about the ways that the data produced by these systems are used have come to the fore. This article has focused on data use within public colleges and universities and finds that these management systems are influenced by external pressures and political conditions in combination with internal organizational characteristics and leadership values. It also has extended the literature on performance information use by empirically exploring performance management as a multidimensional concept that influences distinct management tasks and purposes. In doing so, I find notable differences in the factors that are associated with greater use of different forms of performance data, particularly with respect to use aimed at stakeholder engagement as opposed to use related to evaluation and strategic planning.

Notes

1. To assess potential threats to external validity posed by nonresponse bias, I analyzed respondent characteristics across a wide variety of institutional

If external policy makers hope to influence administrative use of performance information, they will need to pay close attention to both the objective bonuses and penalties that their policies impose for performance, as well as the subjective ways that administrative actors perceive these efforts.

characteristics such as enrollment, mission, region, selectivity, and revenues (see appendix A) and found them to be generally representative of the population of institutions that were surveyed.

2. I conducted analysis for the individual items using both ordinary least squares and ordered probit. Because the findings are substantively similar, I present ordinary least squares results for ease of interpretation.
3. There are some potential issues related to endogeneity regarding these two variables. As one might expect, perceptions about the importance of funding are related to the adoption of performance funding policies. To ensure that this

did not bias my findings, I conducted a series of analyses involving alternate model specifications and found that model results were substantively the same regardless of whether these two measures were included independently or jointly.

4. Although the legislature and executive branches are often treated separately in analyses of political influence, these items correlated relatively highly ($r = .78$), such that including them as separate measures introduced serious issues associated with multicollinearity, which are particularly problematic given the relatively small sample size. Thus, for this analysis, I combine them into a single concept, which measures the influence of state political actors.
5. One potential limitation of this data is that some of the independent variables (which come from the same survey instrument that measures the dependent variables) might be subject to common source bias. Unfortunately, many of these items (such as political ideology) are either infeasible or at least extremely difficult to measure using objective, nonsurvey data sources. While there is considerable debate about the extent to which common source bias is a serious problem for surveys of administrators (Conway and Lance 2010; Meier and O'Toole 2012; Podsakoff et al. 2003), these results should be interpreted with some caution.
6. Given the nested structure of the data, wherein multiple institutions are located in the same state, there is the potential for errors across observations within each state to be correlated. I follow the advice of Arceneaux and Nickerson (2009) and employ clustered standard errors (clustering by state).

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Appendix A Comparison of Survey Respondents and Nonrespondents

	Respondents	Nonrespondents
Average enrollment	11,957	13,499
Average freshmen SAT/ACT Scores (2010)	1034	1035
Median total revenues (in millions)	\$78.59	\$83.72
Average % minority students	20.34%	25.06%
% research universities	28.99%	29.77%
Average % funding from state appropriations	26.12%	26.93%
% in states with performance funding	26.09%	24.42%
% of institutions in selected regions of country		
Far West (AK, CA, HI, NV, OR, WA)	9 (6.52%)	47 (10.93%)
Great Lakes (IL, IN, MI, OH, WI)	21 (15.22%)	60 (13.95%)
Mid-Atlantic (DC, DE, MD, NJ, NY, PA)	18 (13.04%)	89 (20.70%)
New England (CT, MA, ME, NH, RI, VT)	7 (5.07%)	29 (6.74%)
Plains (IA, KS, MN, MO, NE, ND, SD)	18 (13.04%)	33 (7.67%)
Rocky Mountains (CO, ID, MT, UT, WY)	8 (5.80%)	22 (5.12%)
Southeast (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV)	41 (29.71%)	109 (25.35%)
Southwest (AZ, NM, OK, TX)	16 (11.59%)	41 (9.53%)
Total # of universities	138	430

Appendix B Performance Information Use Survey Items

Item (1 = strongly disagree, 7 = strongly agree)	Mean
My institution uses performance data to improve overall decision making.	5.66
My university uses performance data to help identify areas that can be improved or made more efficient.	5.64
My university uses performance data to show outside stakeholders and political actors what we produce with revenues we have.	5.23
Overall, managers at my university use performance data on a regular basis.	5.15
My university uses performance data to track and assess the teaching ability of faculty and instructors within each department.	4.96
My university uses performance data to help managers oversee employees and hold them accountable for their performance.	4.92
Deans at my university are evaluated based on their performance with respect to specific goals and targets.	4.91
Within each department at my university, there are regular schedules and routines for reporting and analyzing performance data.	4.88
My university uses performance data to track and assess the research productivity of faculty and instructors within each department.	4.72