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Benefiting from Public Sector Innovation: The Moderating Role of Customer and Learning Orientation [with Commentary]

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Benefiting from Public Sector Innovation: The Moderating Role of Customer and Learning Orientation

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This article examines whether the payoff from engaging in innovation-generating activities is contingent on an organization's level of customer and learning orientation. The authors suggest that innovative activity is associated with higher public service quality when the level of customer and learning orientation within the focal organization is high. They test this hypothesis by drawing on a novel panel data set covering all public nonspecialist hospital organizations in England. Using dynamic panel data estimation techniques, the authors find strong support for a direct relationship between innovative activity and public service quality and for a moderating role of both customer and learning orientation. These findings call for a contingency perspective on public sector innovation and highlight some of the boundary conditions that need to be in place if public service organizations are to benefit fully from their innovative activities.

The theme of innovation has long moved beyond private sector firms to reach governments and public service organizations around the world. Becoming increasingly prominent in political and administrative discourse, innovation is now widely embraced as a promising driver of public service improvement (Damanpour and Schneider 2009; Walker 2006).

Despite the apparent practical importance of public sector innovation, scholarly research on this topic remains surprisingly scarce. This is true particularly with regard to the complex relationship between innovative activity and public service performance, which is of great theoretical and practical interest. After all, costly innovative activity in the public sector cannot constitute a virtue in itself, but needs to contribute to the provision of better public services. This cannot be taken for granted, however, as innovation and improvement are conceptually distinct, such that one can occur without the other (Hartley 2005). Thus, rigorous research is required to examine whether and—perhaps more important—under which conditions innovative activity contributes to tangible improvements in the quality of public services.

In addressing this question, we seek to build on and extend the still relatively small but rapidly growing literature on the payoffs from public sector innovation (Damanpour and Evan 1984; Damanpour, Walker, and Avellaneda 2009; Walker and Damanpour 2008). These studies have been instrumental in providing the first empirical evidence of a positive link between the adoption of technical, administrative, and managerial innovations, on the one hand, and public service performance, on the other. They have also highlighted, however, the inherent complexity of this relationship, uncovering subtle mediation effects and interactions among distinct innovation types in the public sector. We seek to contribute to this emerging literature in at least two meaningful ways.

First, we focus explicitly on organizational activities dedicated to the internal generation of innovations rather than the adoption of innovations developed externally. As these are two distinct processes, each requiring a different set of organizational capabilities (Damanpour and Schneider 2009), research into the performance consequences of innovation-generating activities in the public sector is clearly needed. By examining the payoff from innovation-generating activities, we complement recent innovation adoption studies and build on cross-sectional insights into the performance effects of innovation generation in the public sector (Salge and Vera 2009).

Second, we extend previous research by adopting a contingency view of public sector innovation, according to which the payoff from innovative activities is expected to depend on certain organizational or environmental attributes. Previous public sector studies have been silent on this important issue. A number of private sector studies, however, have provided considerable support for such a contingency perspective. In particular, specific cultural attributes of the organization have been found to constitute important complementary assets that need to be developed if organizations are to benefit from their innovation efforts (Han, Kim, and Srivastava 1998).

We draw on these private sector insights and focus our attention on two potential cultural contingencies—customer and learning orientation. The conception of customer and learning orientation as attributes of organizational culture is supported not least by Hurley and Hult, who suggest that both attributes manifest themselves in particular “at the cultural level, where over time, stories, reinforcement of behaviors, and the creation of organizational processes produce a basic assumption among employees that customers and learning are important” (1998, 43).¹ In particular, since the advent of New Public Management, both attributes have become increasingly central to our conception of contemporary public service providers as customer-centered and learning-oriented organizations (McLaughlin, Osborne, and Ferlie 2002; Moynihan and Landuyt 2009; Needham 2006).

In this article, we argue that public service organizations with high levels of customer or learning orientation are likely to yield higher payoffs from their innovative activities than their less customer- and learning-oriented counterparts. We test the proposed moderating role of customer and learning orientation by drawing on a novel panel data set that includes archival data from all 153 public nonspecialist hospital organizations in England over the five-year period from April 2002 to March 2007. Using dynamic panel data estimation techniques, we find strong support for our hypotheses.

Theory

The Concept of Innovation

Damanpour defined innovation as “the generation, development, and adaptation of novel ideas or behavior. An innovation can be a new product or service, a new ... process ..., a new structure or administrative system, or a new plan or program pertaining to organizational members” (1991, 556).² It is apparent that the concept of innovation is highly multidimensional, encompassing a wide range of empirical phenomena. Thus, it is not surprising that several innovation typologies have been advanced, including the distinctions between technical and administrative, incremental and radical, and product and process innovations.

Perhaps most fundamentally, the concept of innovation can pertain to both the process of innovation and the outcomes of that process. In this article, we focus on the innovation process and henceforth employ the term “innovative activity” to avoid any terminological confusion. Innovative activity, in turn, can take multiple shapes. These can be categorized into innovation-adopting and innovation-generating activities (Damanpour and Schneider 2009; Salge 2011). Innovation-adopting activities involve the identification, acquisition, and implementation of externally developed new products, services, or processes. Innovation-generating activities, in contrast, involve the internal development of novel ideas and their development into new products, services, or processes that can be implemented internally or marketed externally. Clearly, the external sourcing of novel products, services, and processes and their internal development are two distinct processes, each of which calls for its own set of organizational capabilities. Empirical research into the antecedents, consequences, and enablers of both processes is thus

required. As previous public sector studies have tended to examine the performance consequences of innovation-adopting activities (Damanpour and Evan 1984; Damanpour, Walker, and Avellaneda 2009), we turn our attention to the innovation-generating activities of public service organizations. In the interest of simplicity, however, we continue to simply refer to this process as “innovative activity.”

The Direct Effect of Innovative Activity on Public Service Quality

In their seminal contribution, Cohen and Levinthal (1989, 1990) focused on firms’ research and development (R&D) efforts as a particular form of science- and technology-based innovative activity. In contrast to the then-prevailing economic orthodoxy, they postulated a dual role of innovative activity. In particular, they suggested that “R&D not only generates new information, but also enhances the firm’s ability to assimilate and exploit existing information” (1989, 569). Following this argument, innovative activity has two faces that

reflect the distinct rationales of organizations to engage in it.

The first motive for organizations to invest in innovative activity is the creation of new proprietary information for incorporation into novel products, services, or processes. According to this view, innovative activity can be conceptualized as a search process, by means of which organizations seek to introduce variation into their knowledge bases and

internal routines. As such, innovative activity fuels the continuous renewal and reconfiguration of organizational resources. Innovative activity contributes to maintaining organizational fitness in rapidly evolving environments, which increasingly characterize numerous public sectors (Walker 2008).

The second rationale for organizations to engage in innovative activity is to maintain and enhance their absorptive capacity, that is, their “ability to recognize the value of new information, assimilate it, and apply it” (Cohen and Levinthal 1990, 128). Absorptive capacity relies on sound knowledge of the basic foundations, specific language, and recent developments in a specific technological or scientific field. It enables the focal organization not only to imitate external innovations, but also to incorporate more fundamental external scientific and technological advances into its own innovation-generating activities (Cohen and Levinthal 1989). According to this view, the primary motive for organizations to invest in R&D and innovative activity might be to build their capacity to exploit external knowledge rather than to generate new knowledge internally. As new products, services, or processes often emerge from novel combinations of previously unconnected knowledge elements frequently possessed by external actors such as customers, suppliers, or universities, absorptive capacity is likely to be a vital determinant of innovative performance in the private as well as the public sector (Chesbrough 2003; Harvey et al. 2010).

These two faces suggest a twofold benefit of innovative activity: (1) the generation of novel products, services, and processes, and (2) the strengthening of the organizational ability to learn from new external knowledge. Both benefits of innovative activity can be expected to enhance organizational performance in general and

public service quality in particular. However, as new products, services, or processes might prove ineffective or even harmful if they disrupt existing routines and structures (Hartley 2005), the assumption of a positive performance effect of innovative activity needs to be tested empirically. Findings from quantitative studies located in private sector settings provide some support for the theoretical expectation of a positive innovation–performance link. That said, they also highlight considerable differences in the payoff from innovative activity across industries (Geroski, Machin, and Van Reenen 1993) and innovation types (Jansen, Van Den Bosch, and Volberda 2006). As for the public sector, robust evidence exists primarily with regard to the performance effects of innovation-adopting activities. A study examining U.S. public libraries (Damanpour and Evan 1984), for instance, uncovered that the adoption of administrative innovations facilitated the later adoption of technical innovations, which, in turn, were positively associated with organizational efficiency. A second, more recent study in the context of English local government revealed a positive effect of innovation adoption on staff-assessed performance, but not on auditor-assessed performance (Walker and Damanpour 2008). Further analyses of this data set suggest that divergence from standard innovation adoption patterns might have a beneficial performance effect (Damanpour, Walker, and Avellaneda 2009). While rigorous research on the performance consequences of innovation-generating activities is relatively scarce, Salge and Vera (2009) identified a significant cross-sectional association between innovative activity and the clinical performance of public hospitals.

Given the theoretical arguments presented and the balance of the empirical evidence reviewed, we expect the following:

Hypothesis 1: Public service quality will improve with higher levels of innovative activity.

The Moderating Role of Customer Orientation

Although we expect the level of innovative activity to be positively related to public service quality, we do not assume this link to be universal. Rather, we follow contingency theoretical arguments and suggest that the payoff from innovative activity is likely to be determined by the level of customer and learning orientation in the organization.

The term “customer orientation” is widely employed to describe a set of beliefs that customer needs and satisfaction are the priority of an organization (Deshpandé, Farley, and Webster 1993). In a customer-oriented organization, customer interests always come first. The notion of customer orientation rapidly gained importance in the public sector as management practices from the private sector were adopted as part of the emerging New Public Management paradigm and reinventing government efforts (Osborne and Gaebler 1992). The idea of the citizen as a customer is now widespread and has found its place in public service reforms around the world (Needham 2006). In the context of this study, the term “customer” will refer to the actual service user rather than to the payer of public services, the government, or society at large. It is also not meant

to reduce citizens’ role to one of mere consumers of public services. Rather, it seeks to highlight one specific dimension of what is already a multifaceted conception of the citizen.

We argue that the customer orientation of a public service organization is likely to shape the extent to which that organization is able

We argue that the customer orientation of a public service organization is likely to shape the extent to which that organization is able to translate innovative activity into tangible quality improvements.

to translate innovative activity into tangible quality improvements. As outlined earlier, innovative activity can fail to yield any measurable public service improvement (Hartley 2005), for a number of reasons. First, public service organizations might generate innovations that are meaningless from a customer perspective. This could be attributable to a mistaken assessment of customer needs or of the customer value of a novel product, service, or process. Second, innovative activity

might be triggered by motives other than customer value, such as increasing one’s status or power, giving in to the pressure of mimetic isomorphism, following a fashion, or signaling progressiveness and dedication to improvement to regulators and the broader public (Feller 1981).³ If it is driven by such symbolic motives, innovative activity might fail to demonstrate a positive effect on service quality. It might even have a negative effect when the resources required to fuel innovative activities are withdrawn from normal service provision.

An organization with a culture of strong customer orientation, however, “places the highest priority on continuously finding ways to provide superior customer value ... and advocates a continuous, proactive disposition toward meeting customers’ exigencies” (Han, Kim, and Srivastava 1998, 33). Its innovation-generating activities should be more likely to be driven primarily by the desire to realize substantive service quality improvements. Similarly, a highly customer-oriented public service organization should demonstrate greater motivation to overcome two key translation gaps that might prevent service users from harnessing the benefits of innovative activity. These gaps pertain, first, to the conversion of new knowledge into workable products, services, and processes and, second, to the implementation of such solutions in actual practice (Cooksey 2006). Therefore, we expect the performance benefit from innovative activity to increase with the level of customer orientation of the respective public service organization.

While specific public sector evidence on this matter is still lacking, several private sector studies highlight the role of customer orientation in the innovation process. Deshpandé, Farley, and Webster (1993), for instance, revealed that customer-oriented firms tended to demonstrate superior innovative performance. Similarly, Lukas and Ferrell (2000) found that an emphasis on customer orientation increased the introduction of new-to-the-world products. Nevertheless, innovation scholars have warned that organizations catering solely to the needs of the current customer base risk missing opportunities for disruptive innovation that might yield radical product, service, or process improvements (Christensen and Bower 1996). A number of studies have sought to shed light on this apparent paradox and found that innovative performance will be greatest when the focal organization interacts with heterogeneous and homogenous customers (Bonner and Walker 2004) and seeks

to identify their stated as well as latent needs (Narver, Slater, and MacLachlan 2004).

Overall, we expect customer orientation to positively affect the payoff from public sector innovation:

Hypothesis 2: Customer orientation will positively moderate the relationship between innovative activity and public service quality, such that innovative activity will be more effective in influencing public service quality in organizations with high as opposed to low levels of customer orientation.

The Moderating Role of Learning Orientation

We expect learning orientation to play a similar moderating role as customer orientation. While a customer orientation pertains to the belief among employees that customers are the top priority of the organization, a learning orientation will be reflected in the basic assumption that learning is important within the focal organization (Hurley and Hult 1998). A learning orientation thus refers to an organization’s commitment to learning, that is, the extent to which an organization places value on learning (Sinkula, Baker, and Noordewier 1997).

The concept of organizational learning is central to the contemporary conception of public sector organizations as self-adaptive organizations (Brown and Brudney 2003). Numerous public management reforms such as performance management or total quality management critically rely on the assumption that public sector organizations are able to identify and use new information to improve their actions (Moynihan 2005; Moynihan and Landuyt 2009). What seems to be required is a “wider organizational culture that values learning, acknowledges error without provoking defensiveness, welcomes multiple perspectives, and focuses on the assumptions challenged and information assessed rather than the status of the individuals involved” (Moynihan and Landuyt 2009, 1103). A strong learning orientation is expected to contribute not least to an organization’s absorptive capacity, that is, its motivation and ability to recognize, assimilate, and exploit external knowledge (Cohen and Levinthal 1990). Consistent with such arguments, Hurley and Hult (1998) provided first empirical support for the practical importance of a learning orientation in the public sector. Studying a sample of 56 organizations in a large agency of the U.S. federal government, they uncovered a close association between learning orientation and innovativeness. Similarly, case study evidence provided by Pablo et al. (2007) suggests that a Canadian public health organization managed to enhance its performance by developing, enabling, and maintaining a culture that cherished what they labeled “learning through experimenting.”

Private sector studies paint a similar picture of the benefits of learning orientation. Among others, organizational learning is thought to infuse the organization with ideas and to enhance the capacity to understand such ideas (Damanpour 1991), to question long-held assumptions and behaviors (Sinkula, Baker, and Noordewier 1997), to foster creativity (Gong, Huang, and Farh 2009), and to translate new knowledge into tangible improvements (Baker and Sinkula 1999). Empirical studies support such arguments by identifying a positive relationship between learning orientation and innovative performance (Baker and Sinkula 1999; Calantone, Cavusgil, and

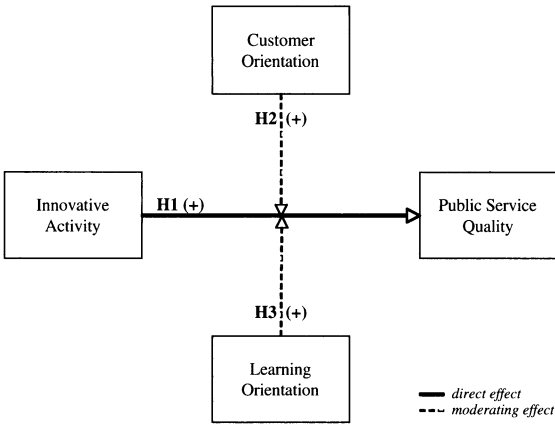


Figure 1 The Conceptual Model

Zhao 2002) as well as organizational performance (Sinkula, Baker, and Noordewier 1997).

Building on these theoretical ideas and empirical findings, we hypothesize the following:

Hypothesis 3: Learning orientation will positively moderate the relationship between innovative activity and public service quality, such that innovative activity will be more effective in influencing public service quality in organizations with high as opposed to low levels of learning orientation.

Overall, we expect innovative activity to have a direct effect on public service quality as well as positive moderating effects on customer orientation and learning orientation. Figure 1 depicts our proposed theoretical model.

Methods
Setting and Data

Innovative activity is widely known to be a highly context-specific phenomenon (Wolfe 1994). Therefore, we decided to examine our hypotheses within a particular public sector setting. We opted for English public hospital services, where attempts to stimulate innovative activity as well as customer and learning orientation have been particularly pronounced (Salge and Vera 2009).

More specifically, we draw on a novel data set that includes archival data from all 153 public nonspecialist hospital organizations in England, each of which is observed over the five-year period from April 2002 to March 2007. Because we include a lagged dependent variable to account for the temporal persistence in public service quality, we effectively lose one year of observations and hence perform our empirical tests based on four years of data from 153 organizations, for a total of 612 observation points. Public hospital organizations in England—the unit of analysis in our study—operate as so-called Acute Trusts under the National Health Service (NHS) umbrella. Each Acute Trust is an independent legal entity with its own board and annual financial statements, usually managing several hospitals (2.35 on average). In 2006–7, nonspecialist English Acute Trusts admitted more than 12.2 million patients for free (i.e., tax-funded) medical treatment. They jointly employed more than 580,000 full-time equivalents and managed more than 35 billion British pounds in taxpayers’ money.

The database underlying this study was populated by integrating archival data provided by numerous actors in the English public health care system, including the Department of Health, the NHS, and Monitor (the independent regulator of NHS Trusts). Whenever archival records were incomplete, we collected the missing information directly from the Acute Trusts, drawing on published material such as annual reports or responses to our own information requests. This procedure resulted in a balanced data set covering the entire population of nonspecialist public hospital organizations in England, without suffering from any missing data problems. Only our indicators of innovative activity were affected by some missing data points, which remained well below 2 percent. The few missing data points could be generated through group mean imputation. This data set was complemented by 72 semistructured interviews with practitioners and policy makers in English public hospital care to familiarize ourselves with the research context, to validate our measures, and to discuss and contextualize our findings.

Measures

Public service quality. When examined from a service user perspective (Ferlie, Hartley, and Martin 2003), public hospitals' primary mission is curing ill or injured patients. At the most elementary level, this means guaranteeing the survival of as many patients as possible. This is obviously likely to depend on the specific characteristics of a hospital's patient mix. An adequate measure of hospital service quality thus needs to take interhospital differences in patient mix into account. For this purpose, the Hospital Standardized Mortality Ratio (HSMR) (Jarman et al. 1999) was developed and now is widely established as a standard measure of hospital quality in numerous countries around the world. The HSMR corresponds to the ratio of actual (i.e., observed) deaths to expected deaths. The HSMR is centered on 100, with values greater (smaller) than 100 indicating a higher (lower) death rate than normally expected, taking into account standardization factors such as patients' gender, age, method of admission, primary diagnosis, and comorbidity. A higher HSMR represents a lower performance level. We used the HSMR data to calculate the risk-adjusted patient survival rate for each hospital organization, defined as the ratio of expected deaths to actual deaths. This transformed measure of public service quality is equally centered on 100 and increases above that level as more patients survive than the statistical expectation. While risk-adjusted patient survival rates reflect a hospital's success at addressing the most severe cases when survival is at stake, they also serve as a suitable proxy for the quality of care in less severe cases. For instance, high risk-adjusted patient survival rates also reflect a superior ability to avoid medical errors and hospital-acquired infections, both of which can be a cause of death among less severely ill patients.

Innovative activity. As set out earlier in this article, we focus on innovation-generating activities. Such activities can come in many shapes, be it scientific, technological, or more pragmatic (Jensen et al. 2007). In this article, we examine science- and technology-based innovative activity, which is particularly salient in the context of public hospital services (Djellal and Gallouj 2005). In employing a set of R&D indicators as a measure of innovative activity, we follow previous studies examining the link between innovation-generating activities and organizational performance (O'Brien 2003). In the NHS, such R&D is described as covering "a spectrum from basic scientific work, through to trials of new treatments and

studies of the organization and management of health services" (U.K. Department of Health 1997, 3). Different forms of innovation—including technical and administrative, product and process, as well as incremental and radical innovations—thus can emerge from hospitals' R&D activities.

Based on this conception of innovative activity, we construct a composite measure based on three R&D indicators.⁴ First, we measure the amount of third-party R&D funding per staff member, which reflects a hospital's ability to attract external financial resources, its actual innovation efforts, as well as its reputation for R&D excellence among external funding bodies (Hagedoorn and Cloodt 2003). Second, we count the number of ongoing R&D projects per staff member as a measure of the current level of innovative activity. Third, we capture the number of scientific publications per staff member emerging from these R&D projects as a proxy for the level of new knowledge creation, which is commonly disseminated within the health care community through peer-reviewed journal articles. All three indicators have already been applied in prior innovation research in the health care arena (Salge 2011, 2012; Salge and Vera 2009) and are used regularly by the U.K. Department of Health to evaluate hospitals' R&D activities (Rogers 2004). The three indicators are highly correlated (Cronbach's alpha, 0.939) and load cleanly on a single factor (variance extracted, 0.892). We use the resulting standardized factor score with a mean of 0 and a standard deviation of 1 as our measure of innovative activity in all subsequent analyses.

Customer orientation. We define customer orientation as a set of beliefs that customer needs are the priority of an organization. As a cultural attribute, this belief should be widely held within the organization. Thus, it seems appropriate to survey a random sample of staff members within each of the 153 hospital organizations to compute staff's aggregate assessment of the level of customer orientation in their respective organization. Access to data from four waves of an annual staff survey allows for such unique multi-informant measurement model of both customer and learning orientation (Walker and Enticott 2004). This survey covers all NHS Trusts in England, each of which draws a random quota sample among all of its staff members, irrespective of hierarchical level or functional area. Response rates across all Acute Trusts are excellent, amounting to 52.71 percent in 2003–4, 56.58 percent in 2004–5, 54.54 percent in 2005–6 and 51.55 percent in 2006–7.

To measure customer orientation, we rely on two survey items, each measured on a five-point Likert-type scale with responses ranging from "strongly disagree" to "strongly agree." First, staff members were asked to respond to the question, "To what extent do you agree with the following statement: Care of patients or service users is my Trust's top priority." Second, they provided answers to the question, "To what extent do you agree with the following statement: If I were a patient of this Trust, I would be happy with the standard of care provided." In 2006–7, an average of 395.09 usable responses to both questions were available for each hospital organization in our sample (min = 169; max = 529). In line with our conception of customer orientation as a cultural attribute, we aggregated these individual-level perceptions of customer orientation to the hospital organization level. To justify such aggregation, we first calculated intraclass correlation (ICC) statistics and found an ICC(2) of 0.98 for both items, well above the 0.70 benchmark required to

demonstrate the reliability of customer orientation means across units. Second, we calculated the level of within-group agreement (r_{WG}), representing the degree of consensus in individual customer orientation perceptions within hospital organizations (mean = 0.48; min = 0.33; max = 0.72). As all r_{WG} values exceeded the level required for statistical significance at the 5 percent level, given a five-point Likert-type scale and a minimum group size of 169, we could reject the null hypothesis of no within-group agreement and aggregate individual-level perceptions of customer orientation to the hospital organization level. The resulting aggregate measure demonstrated a good scale reliability alpha of 0.85.

Learning orientation. We define learning orientation as a cultural attribute reflecting the belief that learning is valued within the focal organization. Thus, it seems appropriate to adopt the same approach for measuring learning orientation as we did for customer orientation. Again, we relied on four waves of the same NHS staff survey. As learning is a highly multidimensional phenomenon, we decided to focus on a particular type of learning orientation. Consistent with Moynihan and Landuyt (2009), we examine the extent to which organizational culture is conducive to learning from errors, near misses, and incidents—a form of learning that has been recognized as an important phenomenon in organization theory (Zhao and Olivera 2006). It is particularly important in the context of public hospital services, where errors are often highly consequential. This is illustrated not least by the fact that in the United States alone, an estimated 100,000 deaths per year are related to medical errors (Zhao and Olivera 2006).

To measure error-based learning orientation, we relied on two survey items, each measured on a five-point Likert-type scale with responses ranging from “strongly disagree” to “strongly agree.” First, staff members were asked to respond to the question, “To what extent do you agree with the following statement: My Trust encourages you to report errors, near misses, or incidents.” Second, they provided responses to the question “To what extent do you agree with the following statement: When errors, near misses, or incidents are reported, my Trust takes action to ensure that they do not happen again.” In 2006–7, an average of 394.47 usable responses to both questions were available for each of the 153 public nonspecialist hospital organizations in our sample (min = 171; max = 525). To justify the aggregation of individual perceptions of hospital learning orientation, we again computed intraclass correlation (ICC(2)) and within-group agreement (r_{WG}) statistics. Our analysis yielded ICC(2) statistics of 0.93 for item 1 and 0.95 for item 2, as well as a mean within-group agreement index (r_{WG}) of 0.73 (min = 0.65; max = 0.78), supporting our aggregation of employees’ error-based learning orientation perceptions to the level of the hospital organization. The resulting aggregate measure of learning orientation demonstrated an adequate scale reliability alpha of 0.87.

Control variables. Public service performance is likely to be affected by a number of contextual variables other than those that are at the center of our study. Therefore, we control for a number of organizational and environmental factors that might confound the relationship of interest.

As for organizational factors, we first adopt O’Toole and Meier’s (1999) conception of public service organizations as autoregressive

systems. In particular, in the public sector, research has revealed that past performance is often one of the best predictors of current performance. Following common practice, we model the inertial nature of public service organizations by including a lagged dependent variable (public service quality [lagged DV]). Second, we control for organizational size by including the total number of hospital beds available for use—the dominant size measure in the health care management literature. Larger hospitals might benefit from easier resource access as well as learning effects thanks to higher treatment volumes and hence might provide a higher quality of care. Third, we account for differences in case load, defined as the number of inpatient admissions per hospital employee. In this context, we assume that a higher case load is likely to be detrimental for risk-adjusted patient survival rates.

As for environmental factors, we first capture differences in regional bed supply, as indicated by the number of hospital beds per 1,000 inhabitants in the regional area. Second, we account for the population health status of the regional population, computed as the difference between 200 and the age-standardized mortality rate of the regional population. These two factors capture essential elements of the regional environment in which the hospital organization is operating and therefore may affect hospital-level decision making with direct relevance to service quality. Finally, we control for year effects by means of time dummies.⁵

Analysis

Our data set includes a cross-sectional and a temporal dimension and, as such, calls for suitable panel data techniques. Moreover, our econometric model is autoregressive in nature, as it includes a lagged dependent variable. Arellano and Bond (1991) developed a so-called system generalized method of moments (GMM) estimator explicitly to deal with such autoregressive models based on panel data with many cross-sectional yet few temporal observations. We use this GMM estimator in our study but also report conventional random effects estimates for comparison. Consistent with good practice in strategic action-performance studies, we introduce a one-year lag for innovative activity to establish the temporal sequencing of dependent and independent variables that is required when seeking to identify cause-and-effect relationships.⁶

Results

Table 1 presents descriptive statistics and pairwise correlations. Given the purpose of this study, it is particularly important to note the considerable variation in public service quality and the strong correlation between innovative activity and public service quality.

The Direct Effect of Innovative Activity on Public Service Quality

Table 2 presents random effects and GMM estimates based on the full sample. As for the control variables, we find strong support for our conception of public service organizations as inertial systems given the strong and highly significant coefficient of public service quality (lagged DV) in models 1a and 1b. We also identify positive effects of population health status and the time dummies, both of which are consistent across models 1a and 1b. We also report the results of three specification tests for all our GMM models. In line with econometric requirements, the test statistic for AR(1) errors is statistically significant, while the test statistic

Table 1 Descriptive Statistics and Pairwise Correlations

Variable	Mean	SD	Min	Max	1.	2.	3.	4.	5.	6.	7.
1. Public service quality	100.1	12.1	55.6	134.0	1.00						
2. Innovative activity	0.0	1.0	-0.7	3.9	0.43*	1.00					
3. Customer orientation	3.3	0.2	2.6	3.8	0.14	0.15*	1.00				
4. Learning orientation	3.6	0.1	3.4	3.9	0.12	0.13	0.66*	1.00			
5. Organizational size	829.6	388.2	250.1	2662.5	0.14*	0.21*	-0.10	-0.08	1.00		
6. Case load	20.7	3.8	0.4	31.0	-0.26*	-0.43*	-0.19*	-0.04	-0.24*	1.00	
7. Regional bed supply	2.6	0.4	1.9	3.5	0.06	0.02	0.22*	0.13	0.19*	-0.19*	1.00
8. Population health status	92.2	13.2	52.6	140.6	0.17*	0.08	-0.22*	-0.24*	-0.32*	0.18*	-0.55*

Notes: N = 612 (153 organizations over four years (April 2003 to March 2007)). *p < 0.01.

Table 2 Analyses for Public Service Quality Based on Full Sample

	Model 1a Random Effects		Model 1b ^a Generalized Method of Moments	
	Coeff.	S.E.	Coeff.	S.E.
Control Variables				
Intercept	20.574	(4.651)**	13.581	(11.093)
Public service quality (lagged DV)	0.760	(0.029)**	0.540	(0.079)**
Organizational size	0.001	(0.001)	0.008	(0.004)*
Case load	-0.129	(0.076)†	0.141	(0.174)
Regional bed supply	1.083	(0.696)	2.844	(1.205)*
Population health status	0.087	(0.025)**	0.216	(0.050)**
Time dummies		Yes**		Yes**
Main Effect				
Innovative activity (lagged)	1.586	(0.447)**	2.968	(1.661)†
Model Statistics				
Arellano-Bond Test for AR(1)		-		-5.290**
Arellano-Bond Test for AR(2)		-		0.670
Hansen J Test		-		45.160
Observations		612		612
R-squared (F-statistic for Model 1b)		0.707**		30.960**

Notes: N = 612 (153 organizations over four years (April 2003 to March 2007)). Unstandardized coefficient estimates reported. Robust standard errors in parentheses.^a This model was estimated using a system GMM estimator. Public service quality is dependent variable. †p < 0.10; * p < 0.05; ** p < 0.01.

for AR(2) errors and Hansen's J test for instrument exogeneity remain statistically insignificant, indicating appropriate model specification.

Hypothesis 1 suggested a positive relationship between innovative activity and public service quality. In line with our theoretical expectation, the regression coefficient of innovative activity is positive and statistically significant both in the standard random effects model (1a), which explains more than 70 percent of the total variance in service quality, and in the preferred GMM model (1b). Moreover, the effect size is considerable, suggesting that an increase in innovative activity of one standard deviation is associated with an increase in public service quality of 2.96 points, according to model 1b. Assuming an initial quality level of 100, it would then move to 102.96, suggesting that 2.96 percent more patients would survive in the respective hospital organization than statistically expected given its case mix.

The Moderating Effect of Customer and Learning Orientation

To test hypotheses 2 and 3 pertaining to the moderating role of customer and learning orientation, we performed our model on four distinct subsamples. The resulting GMM estimates are presented in table 3. These four subsamples were constructed using the median

cutoff criterion, according to which hospital organizations are allocated to distinct groups as a function of their customer and learning orientation. The first subgroup, labeled "low customer orientation," contains those hospital organizations with a level of customer orientation that is below the population median. Conversely, hospital organizations in the second subgroup, labeled "high customer orientation," demonstrate a level of customer orientation above the population median. By performing the model separately on each subgroup, we are able to identify whether the relationship between innovative activity and public service quality varies across groups. This approach to testing moderating effects has been employed in several studies on public sector performance (e.g., Meier and O'Toole 2001) and appears equally appropriate for the purposes of this study.

According to hypothesis 2, we expected public service organizations with a high customer orientation to demonstrate a stronger positive relationship between innovative activity and public service quality than their less customer-oriented counterparts. In line with our theoretical expectations, the regression coefficient for innovative activity in model 2b is positive and highly significant ($\beta = 4.167$; $SE = 1.489$; $p = .006$), while it is negative but not statistically significant in model 2a ($\beta = -3.251$; $SE = 2.913$; $p = .268$). Figure 2 graphically depicts this moderating role of customer orientation, showing that only customer-oriented public hospital organizations are able to translate increases in innovative activity into notable quality improvements. To generate this plot, innovative activity took the value of one standard deviation below the mean (i.e., low) and one standard deviation above the mean (i.e., high). Using the regression estimates for each subsample, we then calculated the resulting service quality level for organizations with high and low customer orientations. The line for low customer orientation is dotted, as this relationship is not statistically significant.

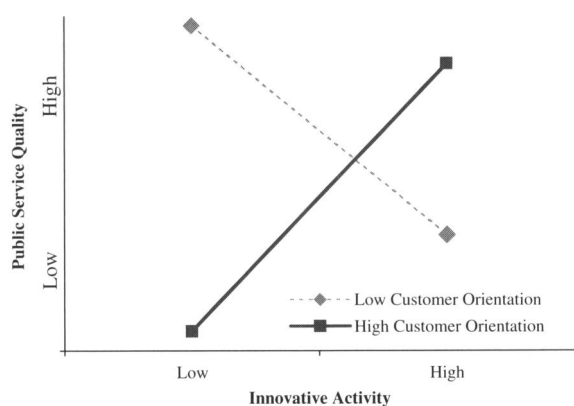
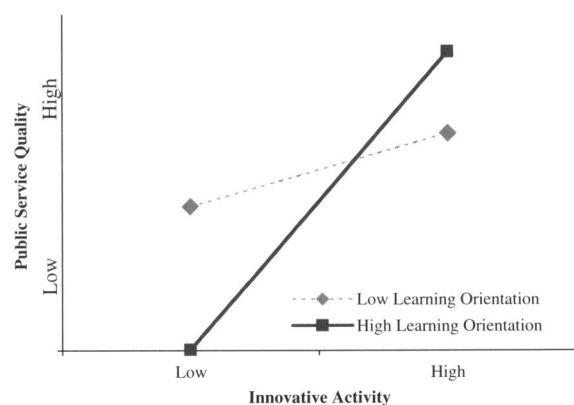
Finally, hypothesis 3 suggested that public service organizations are in a better position to benefit from innovative activity when their learning orientation is particularly pronounced. Consistent with our conceptual arguments, the regression coefficient of innovative activity in model 3b is positive and highly significant ($\beta = 4.261$; $SE = 1.592$; $p = .005$), whereas the positive effect is notably smaller and not statistically significant in model 3a ($\beta = 1.131$; $SE = 3.462$; $p = .745$). Figure 3 illustrates this finding, showing that the positive association between innovative activity and public service quality is much more pronounced for hospital organizations with a high as opposed to a low learning orientation. The dotted line for low learning orientation is again meant to illustrate the lack of statistical significance.

Table 3 Analyses for Public Service Quality Based on Subsamples

	Sub-Samples by Customer Orientation				Sub-Samples by Learning Orientation			
	Model 2a		Model 2b		Model 3a		Model 3b	
	Low Customer Orientation		High Customer Orientation		Low Learning Orientation		High Learning Orientation	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Control Variables								
Intercept	12.363	(12.207)	38.858	(20.237)†	18.460	(13.936)	18.150	(11.470)
Public service quality (lagged DV)	0.550	(0.094)**	0.507	(0.130)**	0.520	(0.094)**	0.617	(0.084)**
Organizational size	0.008	(0.003)**	0.000	(0.004)	0.007	(0.003)*	0.006	(0.004)
Case load	-0.182	(0.241)	-0.124	(0.321)	-0.139	(0.260)	0.070	(0.205)
Regional bed supply	1.615	(1.317)	2.915	(1.570)†	2.193	(1.640)	2.513	(1.454)†
Population health status	0.296	(0.071)**	0.114	(0.040)**	0.268	(0.066)**	0.135	(0.049)**
Time dummies		Yes**		Yes**		Yes**		Yes**
Main Effect								
Innovative activity (lagged)	-3.251	(2.913)	4.167	(1.489)**	1.131	(3.462)	4.621	(1.592)**
Model Statistics								
Arellano-Bond Test for AR(1)		-4.510**		-3.420**		-3.910**		-3.590**
Arellano-Bond Test for AR(2)		0.400		0.680		1.140		-0.180
Hansen J Test		34.510		40.600		42.460		44.000
Observations		304		308		308		304
Model F-statistic		20.620**		19.100**		19.940**		18.400**

Notes: Sub-samples constructed using median-cut-off criterion. Unstandardized coefficient estimates reported. Robust standard errors in parentheses. All models were estimated using a system GMM estimator. Public service quality is the dependent variable.

†p < 0.10; * p < 0.05; ** p < 0.01.

**Figure 2** The Moderating Effect of Customer Orientation**Figure 3** The Moderating Effect of Learning Orientation

We also estimated our model using cross-sectional data only and found consistent results. Additionally, we tested our model based on four rather than two subgroups. Those hospital organizations that demonstrate both low customer and low learning orientation were

found not to benefit at all from innovative activity. This also holds true for hospital organizations with low customer orientation but high learning orientation. Whenever customer orientation is high, however, hospital organizations with both low and high learning orientations were found to benefit from innovative activity. This suggests that a strong customer orientation might be the more vital precondition for translating innovative activity into tangible public service quality improvements.⁷

Discussion and Conclusion

In this article, we sought to advance scholarly knowledge on the payoffs from innovative activity in the public sector. We developed three hypotheses pertaining to the performance consequences of innovation-generating activities in the public sector. We submitted each to an empirical test based on novel panel data from the entire population of public nonspecialist hospital organizations in England. In doing so, we provided evidence supporting our theoretical hypotheses of (1) a direct effect of innovative activity on public service quality and a positive moderating effect of (2) customer orientation and (3) learning orientation.

Implications for Research

Although we are by no means the first to study the innovation activities of public service organizations, we believe that our findings have meaningful implications for scholarship. In particular, we would like to highlight two important ways in which our study adds to the emerging literature on public sector innovation.

First, our finding of a positive link between innovation-generating activities and public service quality complements previous public sector studies that have focused on the performance consequences of innovation-adopting activities (Damanpour and Evan 1984; Damanpour, Walker, and Avellaneda 2009; Walker and Damanpour 2008). As innovation generation and adoption are two distinct processes (Damanpour and Schneider 2009), our study adds to the few existing studies that examine public service organizations

as important generators of new products, services, and processes (Borins 2000; Salge 2011, 2012; Salge and Vera 2009). In so doing, we hope to contribute to a more adequate representation of both innovation types.

Second, we provide strong support for a contingency perspective on public sector innovation, according to which the payoffs from innovative activity depend on several key boundary conditions. In particular, we highlight the complementary role of organizational culture in enabling the organization to translate innovative activity into tangible performance improvements, which hitherto has remained largely underexplored in the literature on public sector innovation. More specifically, our findings underline the notable salience of organizational culture as a key moderator of the innovation–performance link, not only in the private sector but in the public sector as well (Han, Kim, and Srivastava 1998). Overall, our study highlights that improvements from innovative activity do not occur automatically but are contingent on the presence of complementary assets. Thus, our research provides empirical support for earlier theoretical arguments, according to which innovative activity can take place without any tangible public service improvements if critical boundary conditions are not met (Hartley 2005). If present, however, these boundary conditions can substantially increase the organizational payoff from innovation-generating activities.

Implications for Practice

We also hope that our findings will be of some interest to public administration practitioners. First and most important, our findings suggest that time and resources dedicated to fostering innovation-generating activities are likely to be well invested given the strong association between innovative activity and public service quality. This is illustrated by our estimates, according to which an increase in innovative activity by one standard deviation is associated with an increase in public service quality of 2.96 points. In the specific setting of our study, this might translate—depending on the number of deaths expected to occur in each public hospital—into saving the lives of dozens of critically ill or severely injured patients.

Second, this study is meaningful for public administrators in that it highlights some of the boundary conditions that need to be in place if public service organizations are to benefit fully from their innovative activities. In particular, we point public administrators to the value of establishing a culture that values customer and learning orientation. Public service organizations might be well advised to make customer service a top priority and to encourage learning from errors, near misses, and incidents. This is vital, as performance benefits from innovative activity might well remain elusive in absence of these cultural attributes.

Limitations and Future Research

Further research is required to extend this study and to address some of its key limitations. While promising avenues for future research

are manifold, it appears particularly important to validate our findings for other forms of innovation-generating activities such as less science- and technology-based forms of innovation, for further outcome measures such as the cost-efficiency of service delivery or the level of service user satisfaction, as well as for additional public sector contexts such as education, security, or local government. In doing so, future studies might wish to refine our measurement instruments pertaining in particular to the customer and learning orientation constructs, both of which are currently assessed using only two survey items each. Although we highlight considerable convergence of individual perceptions of customer and learning orientations within organizations, it still appears useful to identify possible systematic differences among individual perceptions within the same organization. While this was beyond the scope of the present

study, such differences might exist across professional groups and hierarchical levels for instance (Walker and Enticott 2004). Future research could also take the form of more formal cost–benefit analyses that make an attempt to contrast the economic cost of engaging in innovation-generating activities with the benefits directly experienced by service users. More generally, we hope that our study will stimulate further research on

those organizational and environmental contingencies that are most likely to affect the extent to which organizations and service users can harness the benefits from innovation-generating activities in the public sector.

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Notes

1. Organizational culture will be defined as “the pattern of shared values and beliefs that help individuals understand organizational functioning and thus provide them with the norms for behavior in the organization” (Deshpandé and Webster 1989, 4).
2. The conception of newness is typically relative, meaning that a certain object has to be considered novel by members of the focal entity in order to count as an innovation.
3. According to Feller, public sector innovation may be not more than “a form of political ‘circuit’ by which a public agency seeks to convince the public of its progressive and presumably efficient mode of operation” (1981, 14).

[O]ur study highlights that improvements from innovative activity do not occur automatically but are contingent on the presence of complementary assets.

[O]ur findings suggest that time and resources dedicated to fostering innovation-generating activities are likely to be well invested given the strong association between innovative activity and public service quality.

4. Following common practice, we normalize all R&D indicators to account for differences in size. However, our empirical findings are not sensitive to this normalization.
5. It is important to note that our conclusions with regard to the three hypotheses developed in this article remain qualitatively identical when excluding any of our control variables.
6. Time effects and environmental control variables are treated as exogenous, lagged innovative activity as endogenous, and all other independent variables as predetermined.
7. We would like to thank one of the anonymous reviewers for this valuable suggestion.

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Commentary

Can Innovation Flourish at a Time of Austerity and Service Reorganization?

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Let us assume that Torsten Oliver Salge and Antonio Vera, in their article “Benefiting from Public Sector Innovation: The Moderating Role of Customer and Learning Orientations,” are correct and that a direct relationship exists between innovative activity and public service quality, and both customer and learning orientation play a moderating role in this relationship. This assumption defers consideration of whether the Hospital Standardized Mortality Ratio is a broad enough concept to encompass all aspects of the quality of service that patients (customers) might reasonably expect, or whether research and development indicators are sufficient to describe innovation in the English National Health Service (NHS), most of which is not directly linked to an academic institution.

If innovation drives public service quality, a key issue for leaders and practitioners will be the extent to which innovation can be generated in those

organizations in which it has not already taken hold or extended and advanced in those organizations in which it has not been fully exploited. Such further development of innovation poses some practical questions in the current context and foreseeable future of the English NHS:

- How can we generate qualitative innovation at a time of major financial restraint?
- How can we generate qualitative innovation at a time of major reorganization?

How Can We Generate Qualitative Innovation at a Time of Major Financial Restraint?

The English NHS is currently charged with finding 20 billion British pounds in efficiency savings by 2015 against an annual budget of 106 billion pounds (2011–12). This is about 4 percent per annum. While cash budgets are rising by 0.1 percent, inflation in the

health service is rising at a much quicker rate, and this is coupled with increasing costs associated with an aging population and rising levels of obesity.

For many services, the imperative is to reduce costs quickly, which leaves little time for thinking about and implementing qualitative innovation. The temptation is often to “salami slice” the budget to show in-year financial “success” rather than to invest in longer-term cost-saving innovation. A good example is the area of telemedicine, where long-term savings might be achievable together with improvements in health care, but there is no practical scope for investment within a budget that is limited by financial year savings targets.

Despite the scope and size of the NHS (the world’s fourth-largest organization after the Chinese People’s Liberation Army, Walmart, and the Indian Railways), managers are told that ideas to help innovate at a time of financial restraint are “out there” in the NHS itself. The NHS Institute for Innovation and Improvement exists to assist in the search for locally useful solutions. Mining its massive resources is a job in itself, which begs the question of where innovation starts in a large organization such as a hospital. To what extent should innovation be organizationally driven, and to what extent does innovation lie within the gift of clinical specialties? Should whole hospitals promote innovation, or should hospitals encourage innovation where there are creative leaders able to organize and implement innovation? Some further help with addressing the question of whether top-down or bottom-up innovation works best at a time of financial crisis would be welcome.

The current NHS financial context also raises questions about the sustainability of a customer and learning orientation when jobs and services are at risk, as well as about the realistic potential for innovation in a crisis (just when it is needed most).

I would encourage future research to consider these questions as a basis for providing useful insights for practitioners facing the challenge of promoting innovation in times of major financial restraint.

How Can We Generate Qualitative Innovation at a Time of Major Reorganization?

Before the last general election in the United Kingdom, the Conservative Party announced that there would be

no more top-down reorganizations of the NHS, and the coalition government reaffirmed this promise when it came to power. In reality, every part of the NHS is now facing (and starting to implement, despite delays in the legislative timetable) the most radical structural reorganization since its inception in 1948. Given the scale of this enterprise, the time frame for these changes is rapid, with Primary Care Trusts (commissioners or purchasers of care on behalf of the local population) facing abolition by March 31, 2013. This role will then be undertaken by general practitioners (GPs), many of whom are said to be unready or unwilling to do so.

These changes will create uncertainty. Newly empowered GP commissioners, who have not had this responsibility before, may have untested priorities for hospital-based health care, further destabilizing a system that is already struggling with major cost reduction. Their new focus on living within budget may also skew priorities away from well-tested pathways of care.

Effective innovation requires time and clarity of thought. It sometimes requires time to fail and renew, but without damaging patient care in the process. As Salge and Vera point out, it also requires a learning orientation and customer focus. In the next few years, most learning in the NHS is likely to be focused on learning new skills and accepting new responsibilities in line with the structural changes proposed in the Health and Social Care Bill. Locally based commissioning may go on to produce effective innovation in some instances, which is what the bill envisages as part of its commitment to localism. Where there is a need to test and renew (i.e., to fail as part of generating new knowledge about what works), there might not be sufficient resources to ensure that patients are not unwittingly put at risk.

This raises another question: what is the most fertile environment for propagating qualitative innovation, stability or organizational change? And further, given that we face radical organizational change, how can we secure the conditions (including a learning and customer orientation) to promote innovation and public service quality?

I hope that future research will go on to complement Salge and Vera’s study by exploring how a culture of innovation and learning and customer orientation can be established and sustained in times of both stability and radical organizational change.

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