Do Frontline Mechanisms Matter? Impact of Quality and Productivity Orientations on Unit Revenue, Efficiency, and Customer Satisfaction

This study identifies a frontline mechanism comprising autonomy, cohesion, and feedback that helps explain when and why the simultaneous pursuit of quality and productivity orientations has positive or negative effects on unit revenue, efficiency, and customer satisfaction. An empirical test of the proposed framework using data from 423 employees in 30 strategic business units and longitudinal unit-level performance data indicates that frontline autonomy mediates the positive impact of productivity and quality orientations on unit revenue and customer satisfaction and their negative impact on unit efficiency. Feedback amplifies the influence of frontline autonomy by simultaneously enhancing its positive effect on satisfaction and its negative effect on efficiency. In contrast, unit cohesion strengthens the positive effect of frontline autonomy on revenue and customer satisfaction without augmenting its negative effect on unit efficiency. The results urge managers to shift their focus toward unit-level mechanisms to find clues for managing strategic dilemmas that stem from multiple goal pursuit in face-to-face service settings.

Keywords: frontline mechanism, quality orientation, productivity orientation, revenue, efficiency, customer satisfaction

Attaining bottom-line results that are both superior and sustainable becomes more difficult when an organization faces conflict between two or more desirable business orientations (Anderson, Fornell, and Rust 1997; Bateson 1985; Grönroos and Ojasalo 2004; Rust, Moorman, and Dickson 2002). This is especially true for service organizations. Consider the simultaneous adoption of a quality orientation, which focuses on achieving a high level of service quality, and a productivity orientation, which focuses on attaining high internal efficiency. Empirical evidence suggests that service companies that adopt both orientations have conflicting strategic goals of efficient resource deployment and effective customer retention (Bateson 1985). Anderson, Fornell, and Rust (1997) report that service companies experience a negative correlation between productivity and satisfaction, whereas product companies do not (−.30 versus .15), and the simultaneous pursuit of productivity and satisfaction also has a negative, albeit marginal, effect on profitability (see Bucklin 1978). Grönroos and Ojasalo (2004, p. 415) characterize the cumulative evidence as indicative of a service productivity dilemma, such that “increased internal efficiency following the introduction of more cost effective and seemingly more productive processes” may lead to lower service quality and lost revenues.

The practitioner literature is replete with examples of service organizations struggling with this dilemma. For example, Starbucks’s chairman, Howard Schultz, recently took the unusual step of publicly releasing a “blunt” memo to his executives, warning that Starbucks’s drive for growth and efficiency (e.g., automatic espresso machines instead of in-store coffee grinding) was compromising the quality of the customer experience, the very reason for the firm’s phenomenal success and ability to charge premium prices (Adamy 2007). Although this is an unusual step for Starbucks’s chairman, the underlying dilemma is not unusual for many service organizations (Hindo 2007; Singh 2000).

However, practitioners and researchers agree that despite trade-offs in their simultaneous adoption, both pro-
ductivity and quality are necessary orientations, especially in services with a significant labor component, such as banking, education, health care, and entertainment (Mittal et al. 2005). Consider the case of health care. For years, the industry focused on quality without regard for productivity; now, the market is demanding that it increases productivity without sacrificing quality. Health care providers, regulators, and insurance providers are publicizing report cards that evaluate and rank hospital on both cost (lower costs are associated with higher productivity) and quality criteria. The goal is “to steer consumers to better-performing hospi-
tals—and reward hospitals and doctors for providing higher-quality, cost-effective care” (Landro 2004, p. D1). Parallel market pressures are evident in other services as well (Ante and Sager 2002; Carey and Frangos 2005).

Similarly, researchers have argued that the productivity–quality trade-off should not be taken to imply that service firms should not seek improvements in both productivity and customer satisfaction (Anderson, Fornell, and Rust 1997; Grönroos and Ojasalo 2004). Various solutions have been conceptually proposed to address the productivity–quality dilemma, including process improvement through information technology applications (Anderson, Fornell, and Rust 1997), better management of frontline human capital through autonomy (Singh 2000), and continuous learning in the frontline units (Grönroos and Ojasalo 2004). Recent empirical evidence suggests that firms that manage to achieve both productivity and quality orientations enjoy superior long-term financial returns, highlighting that successful implementation remains a key challenge (Mittal et al. 2005). Collectively, these studies suggest that service organizations have a strategic imperative to pursue both improved productivity and improved quality. Understanding the mechanisms that intervene between these orientations and performance appears essential to manage the apparent conflict that arises in adopting productivity and quality orientations.

The purpose of this study is to investigate when and why the simultaneous pursuit of productivity and quality goals results in positive or negative outcomes for a service business unit by identifying an intervening mechanism between a strategic business unit’s (SBU’s) strategic orientations and its performance outcomes. Building on Day and Wensley’s (1988) notion of dynamic capabilities as warehoused in a service unit’s practices and routines, we conceptualize an intervening mechanism as including autonomy, feedback, and cohesion among a unit’s frontline employees. Such mechanisms, referred to as self-management practices, have been shown to explain unit outcomes, such as service quality, satisfaction, and customer loyalty (Batt 1999; De Jong, De Ruyter, and Lemmink 2004).

We focus on frontline employees because their direct contact with customers makes their performance a key factor in a service unit’s effectiveness (Heskett, Sasser, and Schlesinger 1997). To our knowledge, no study to date has examined the mediating role of frontline mechanisms on unit performance and satisfaction outcomes. Although prior research has often made the organization the unit of analysis, we follow the lead of strategy work and recent services research in choosing the SBU as the focal unit of analysis (De Jong, De Ruyter, and Lemmink 2004). Given the heterogeneity in routines and practices in a diversified, multiunit organization, the SBU is a more suitable level for analysis because it mitigates aggregation biases. This is especially relevant when the SBUs are functionally diverse to serve a range of customer needs, such as in health care (e.g., radiology, surgery, ob-gyn) and financial services (e.g., personal banking, insurance; Bucklin 1978). We test the proposed framework using survey data from 423 employees in 30 SBUs, as well as longitudinal unit-level archival and customer satisfaction data for the corresponding units.

Conceptual Model and Hypotheses

Three key elements of our proposed model (see Figure 1) are notable. First, longitudinal archival data provide information on an SBU’s unit revenue, efficiency, and customer satisfaction, which allows for the possibility of contrasting effects and trade-offs among these outcomes. Unit revenue refers to an SBU’s total revenue per unit of output, unit efficiency refers to the total labor cost per unit of output, and satisfaction refers to customers’ evaluations of delivered service.

Second, the proposed frontline mechanism is indicated by the interrelationship of autonomy, cohesion, and feedback for a unit’s frontline employees. We posit that this mechanism mediates the effects of productivity and quality orientations on service outcomes.

Third, drawing on control theory (Eisenhardt 1985; House and Rizzo 1972) and supporting empirical evidence (Bandura and Cervone 1986; Baron and Kreps 1999; Durham and Bartol 2000; Larkin and Larkin 1996), we propose that management practices are key manifestations of a unit’s strategic orientations. Management practices are actions and directives that flow from management priorities and guidelines for regulating employee efforts toward desired goals (Hambrick and Mason 1984; Simons 2000).

Productivity and Quality Orientations

We define productivity orientation as management practices oriented toward maintaining high levels of internal efficiency and cost control, and we define quality orientation as management practices oriented toward achieving high levels of service quality and customer satisfaction. Prior studies indicate that within an organizational unit, employees’ interpretation of managerial decisions and priorities may result in perceptions of practices in use that differ from what managers intended (Gregory 1983; Lytle, Hom, and Mokwa 1998; Schneider 1987). Employees make sense of managerial practices through an iterative process of receiving managerial inputs, responding to managerial expectations, and adjusting their actions on the basis of managerial feedback (Schneider et al. 2003). Because employee attitudes and performance are direct precursors to unit outcomes (Harter, Schmidt, and Hayes 2002; Heskett, Sasser, and Schlesinger 1997), researchers have argued that employee perceptions are useful for the study of organizational orientations and their performance impact. Lytle,
Hom, and Mokwa (1998, p. 458) go so far as to claim that an “orientation of an organization is what its employees perceive it to be.” Thus, we conceptualize that productivity and quality orientations are reflected in managerial practices as reported by the frontline employees of an organizational unit.

The Role of Frontline Mechanisms Involving Unit Autonomy, Cohesion, and Feedback

Most studies have examined the direct effect of strategic orientations on performance (Gatignon and Xuereb 1997; Rust, Moorman, and Dickson 2002; Voss and Voss 2000). To our knowledge, however, no study has yet examined or identified the mechanisms mediated by frontline employees that facilitate or hinder the successful adoption of a unit’s productivity and quality orientations (Mittal et al. 2005). We argue that without well-aligned frontlines, a unit’s strategic orientations are less likely to generate the anticipated outcomes. We develop hypotheses for these frontline mechanisms in shaping an SBU’s productivity–quality trade-offs. We do not specifically hypothesize direct effects of unit practices on outcomes, because such hypotheses represent no incremental insights to those in prior research.

However, we include the direct-effect paths in our estimations. To examine the incremental contribution of the proposed model, we compare it with a direct-effects model that omits the intervening frontline mechanisms and represents extant research in the field.

The frontline autonomy mechanism. According to job design theory, the structure and design of a job directly regulates employees’ effort to achieve organizational goals (Cooper and Foster 1971; Cummings 1978). Typically, managers have a choice between external control (through hierarchical supervision, work scheduling, and standardization) and internal control (through the promotion of self-regulation and self-determination among frontline employees) (Langfred and Moye 2004; Mills and Ungson 2003). Managers attempt to choose the control system that will be most effective in goal attainment, given the specifics of job requirements.

We reason that by altering the level of autonomy afforded in frontline jobs, managers can vary the control mechanism along a continuum from external control (low autonomy) to internal control (high autonomy). In self-determination theory, autonomy is a central variable for supporting an internal mechanism that enhances frontline
employee motivation and participation (Deci and Ryan 1987; Hackman and Oldham 1976). Designing jobs with greater autonomy shifts the locus of control from the manager (external) to the employee (internal).

Consider the managerial choice of control when quality goals are emphasized. In this case, managers are likely to require that employees provide customized or individualized solutions to meet heterogeneous and unpredictable customer needs. This requirement entails designing frontline jobs for higher levels of autonomy. This is because managers are unable to anticipate the variety of possible customer needs and must rely on employees’ “local knowledge” to provide solutions that address those needs. In other words, the appropriate control mechanism for maintaining a high level of service quality is delegation of decision-making power and accountability (Argote 1982; Bowen and Jones 1986; Zeithaml and Bitner 1996).

In contrast, when managers emphasize a productivity orientation, they prioritize productivity goals, such as increasing the output–input ratio and controlling costs. In this case, managers are likely to try to limit variability in frontline performance and to support standardized solutions for customers’ varying needs (Bowen and Lawler 1992). Hierarchical supervision and limitations on autonomous action by frontline employees—in other words, external control mechanisms—are likely to be preferred managerial choices because they are effective at reducing variability in productivity goal attainment, resulting in a negative influence on frontline autonomy.

In turn, frontline autonomy is hypothesized to be positively associated with a unit’s revenue and customer satisfaction (Anderson, Fornell, and Rust 1997; Mittal et al. 2005; Rust, Moorman, and Dickson 2002) and negatively associated with a unit’s efficiency (Levy and Pashler 2001; Osman and Moore 1993). Frontline autonomy promotes effective response to quality challenges, customer needs, and recovering service failures (Bowen and Lawler 1992), resulting in increased customer satisfaction and revenues. However, autonomy can engender unnecessary variability, slow the speed of service delivery, and increase employees’ cognitive burden for task selection and strategy (Langfred and Moye 2004; Pashler 1998; Rubinstein, Meyer, and Evans 2001), thus hurting unit efficiency.

On the basis of the preceding insights, we propose that autonomy is likely to mediate positively the effect of a unit’s quality orientation on outcomes related to service quality (e.g., customer satisfaction and revenue) but mediate negatively the effect of productivity orientation on efficiency-related outcomes. Thus:

**H1**: Frontline autonomy positively mediates the influence of quality orientation on customer satisfaction and revenue generation such that (a) the greater the unit’s quality orientation, the higher is the level of perceived autonomy among its frontline employees and (b) perceived autonomy is positively associated with customer satisfaction and unit revenue.

**H2**: Frontline autonomy negatively mediates the influence of productivity orientation on unit efficiency such that (a) the greater the unit’s productivity orientation, the lower is the level of perceived autonomy among its frontline employ-

es and (b) perceived autonomy is negatively associated with unit efficiency.

Furthermore, different organizational units may vary in the degree to which they emphasize productivity- and quality-oriented practices. Unit managers may not fully recognize productivity–quality trade-offs; they may believe that they need to emphasize both because of top management directives, or they may believe that they can effectively overcome productivity–quality conflicts. Other managers may place greater emphasis on one orientation while keeping both in focus because it fits the needs of their unit or provides an effective way of diffusing the tension between the two orientations. Regardless of the reasons, a simultaneous pursuit of multiple orientations is conceptualized in most previous studies by including a product term involving the focal orientations, as we show in Figure 1 (e.g., Rust, Moorman, and Dickson 2002). The notion of trade-offs is captured by the dysfunctional influence of the product term, whereas the individual orientations on their own may have a positive, functional effect (Anderson, Fornell, and Rust 1997).

We posit that when quality and productivity orientations are simultaneously emphasized, unit managers need to grant frontline employees increased autonomy to help them cope with the inherent tension of quality- and productivity-oriented tasks (Anderson, Fornell, and Rust 1997; Singh 2000). That is, the simultaneous adoption of productivity and quality orientations entails multiple comparison standards and task interrelatedness, which require greater discretion and coping efforts on the part of employees. For example, frontline employees may be required to reconcile service quality feedback (e.g., not enough customer attention) that conflicts with productivity feedback (e.g., service delivery must be accomplished more quickly). In such instances, managers are likely to give frontline employees greater autonomy so that the employees can effectively reconcile this conflict through creative problem solving. Thus, we expect that the interaction effect of productivity and quality orientations on frontline autonomy will be positive. Moreover, when combined with our prediction for linear effects (H1 and H2), we expect contrasting patterns for the impact of productivity and quality orientations. Specifically, we expect that the negative linear association between productivity orientation and autonomy will become less negative or even positive when managers simultaneously implement a quality orientation. In contrast, the positive association between quality orientation and autonomy will be enhanced with an increased, simultaneous emphasis on productivity orientation.

**H3**: The interaction between a unit’s quality and productivity orientations is positively associated with autonomy among a unit’s frontline employees.

The autonomy–performance moderators. Designing jobs for frontline autonomy risks loss of some organizational control, even when the job demands require it. Mills and Ungson (2003, p. 146) point out that control loss is associated with attrition of goal-directed outcomes because employees “may not understand what they are supposed to
do or may not choose to do what is expected of them.” Managers attempt to manage this control loss by supporting other mechanisms that moderate the autonomy-performance relationship. Moderators of interest involve unit characteristics that bolster the expected positive effect of frontline autonomy on unit outcomes, thus curtailing control losses. We investigate two frontline unit characteristics—unit cohesion and performance feedback—that are posited to moderate the autonomy—SBU outcomes relationship. Specifically, we argue that performance feedback operates by directing frontline employees’ behaviors toward what they are supposed to do and that unit cohesion helps by maintaining frontline employees’ commitment to these goals. Moreover, the pursuit of multiple, usually conflicting goals in frontline context adds another layer of complexity to the moderating effect of performance feedback and unit cohesion.

The moderating effect of unit cohesion. We posit that in face-to-face service settings, unit cohesion amplifies both autonomy’s positive effect on revenue and customer satisfaction and its negative effect on efficiency. To understand this effect, consider the mechanism by which unit cohesion influences group processes and functions in the pursuit of multiple goals. As a recent meta-analysis demonstrates (Mullen and Copper 1994), a positive relationship between group cohesion and performance occurs because of group members’ commitment to shared goals and their ability to self-regulate their collective behavior to that end (see Stogdill 1972; Terborg, Castore, and DeNinno 1976). However, if the group’s shared goals are inconsistent with organizational goals, a more cohesive group will perform relatively poorly compared with a less cohesive group, especially when the group has autonomy in goal pursuit and regulation (see Cherrington et al. 2001).

Thus, the effects of unit cohesion depend on how well the employees’ shared goals match the organization’s goals. In face-to-face service settings, several studies have confirmed that frontline workers and their organizations are aligned in their pursuit of quality goals (e.g., providing high levels of medical care) but differ in their priority for productivity goals (e.g., providing cost-efficient care; Begat, Elffesen, and Severinson 2005; Summer and Townsend-Rochchicioli 2003; Weinberg 2003). That is, whereas management tends to place high priority on productivity goals (e.g., providing cost-efficient care; Begat, Elffesen, and Severinson 2005; Summer and Townsend-Rochchicioli 2003; Weinberg 2003). Thus, it is possible for employees to come to the conclusion that they are not being rewarded for their efforts. This discrepancy results in a lack of commitment to the organization and its frontline employees. Subsequently, we confirm this empirically with a follow-up study (see the Appendix). This discrepancy is sometimes reflected in unusual business practices. Consider the case of the common airline practice of overbooking flights to increase efficiency. In a recent article, Baily (2007) reported that gate agents (frontline employees) who were appalled by such overbooking practices took the matter into their own hands by creating phantom reservations (e.g., using names such as the airline chief executive officer) to keep a flight from being oversold. Situated at the interface with the customer, gate agents were motivated to minimize dealing with bumped, dissatisfied passengers and to keep the customer experience positive.

Accordingly, we reason that cohesion in frontline units is likely to enhance the functional effect of autonomy on unit revenue and customer satisfaction because frontline units and management are aligned in their quality goals and emphasis on service quality. In contrast, the discrepancy between the importance management and employees place on productivity goals means that unit cohesion is likely to amplify the negative effect of autonomy on unit efficiency. Recall that we argued that unit autonomy reduces efficiency because it diverts cognitive resources to task selection and strategy. With increased unit cohesion, we posit that frontline employees are more likely to direct their cognitive resources toward aligned goals (quality) and away from discrepant goals (efficiency). Thus:

H4: Units with greater cohesion among frontline employees also demonstrate a stronger (a) positive effect of frontline autonomy on unit revenue, (b) positive effect of frontline autonomy on customer satisfaction, and (c) negative effect of frontline autonomy on unit efficiency.

The moderating effect of performance feedback. We posit parallel hypotheses for the moderating effect of feedback on the relationship between autonomy and unit outcomes. We define feedback as the information managers provide to unit employees to direct employees’ service performance. Our logic is based on studies of feedback when multiple goals are being pursued. A widely shared assertion is that feedback improves outcomes in high-involvement systems because feedback identifies performance gaps (e.g., when and where performance is below goal levels), and autonomous employees can regulate their efforts to reduce gaps (Kernan and Lord 1990; Klein 1989). However, according to feedback intervention theory (Kluger and DeNisi 1996), people assign higher priority to feedback gaps related to goals that are more important and involve higher commitment (Locke and Latham 1990; Terborg and Miller 1978), and this hierarchical priority directs people’s effort and resource deployment. Thus, employees are less likely to allocate extra effort and resources to reduce performance gaps for goals they deem to be less important or attractive and more likely to ignore or reject managerial feedback related to those goals (Hollenbeck and Williams

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1There is evidence that service occupations self-select employees who tend to be intrinsically motivated for service effectiveness. For example, empirical studies show that when organizations adopt a customer-oriented culture, frontline employees show high job satisfaction and commitment (Ruekert 1992; Siguaw, Brown, and Widing 1994).

2In the follow-up study, we collected data from unit managers. By matching manager and employee data, we computed a D statistic (Cronbach and Gleser 1953) as an indicator of goal incongruence between frontline employees and managers for each unit and separately for productivity and quality orientations. The results indicate that managers and frontline employees differ significantly in the importance of productivity goals (mean D = 2.03) compared with quality goals (mean D = .50), with a significant discrepancy for the former (t = 13.12, d.f. = 46, p < .01).
1987; Taylor, Fisher, and Ilgen 1984). This implies that autonomous frontline employees in face-to-face service settings are likely to give less credence to managerial feedback related to productivity goals and, instead, focus efforts on reducing performance gaps related to quality goals. This is because they tend to place a higher priority on quality goals than productivity goals, and they are aligned with managers with regard to quality but not productivity goals. Thus, increasing performance feedback is likely to direct the effort of autonomous frontline employees toward quality goals and away from productivity goals, which suggests a negative autonomy–efficiency relationship under this condition.

H₅: Units whose frontline employees receive more performance feedback demonstrate a stronger (a) positive effect of frontline autonomy on unit revenue, (b) positive effect of frontline autonomy on customer satisfaction, and (c) negative effect of frontline autonomy on unit efficiency.

Method

Research Design

Setting. We chose nonprofit hospitals as our research setting for several reasons. First, the health care industry operates in a dynamic and competitive environment that demands both high quality and productivity (Fennell and Alexander 1993). Traditionally focused exclusively on their service mission, nonprofit hospitals have begun emphasizing productivity in addition to quality (Aiken, Sochalski, and Lake 1997). Therefore, the questions posed in this research are especially relevant for them. Second, hospitals are organized around distinct units that perform frontline functions by interacting directly with patients but that differ in terms of specific tasks (e.g., the tasks of a surgery unit differ from those of a pediatric unit) as well as composition and skill base of their employees (e.g., radiologists have different skills than obstetric nurses). Thus, hospital units can be viewed as relatively independent SBUs and treated as the units of analysis. We selected one hospital in the northeastern United States for this study. Selection of one hospital with multiple frontline units affords variation in the focal variables, while minimizing potentially confounding variables due to differences in organizational contexts.

Data sources and sampling. Data were collected from multiple sources. We used key informant data for the proposed independent, mediating, and moderating variables; longitudinal archival data for unit service performance, including revenue, and efficiency; and longitudinal satisfaction data collected from patients. Because frontline mechanisms can be best understood by securing data from frontline employees who are directly involved in these practices, every employee with direct patient interactions was considered a possible key informant and was mailed a questionnaire packet that included (1) a letter from the researchers describing the purpose of the study, (2) a seven-page questionnaire, (3) a return postage-paid envelope, and (4) a lottery-card-based incentive (for a demographic profile, see Table 1). We obtained complete responses from 729 employees in 47 units, for a response rate of 45%. A comparison of early and late respondents revealed no significant mean differences for study variables, with the exception of cohesion (F = 3.99, p = .046), which reduces to nonsignificance after we control for the number of comparisons and overall Type I error rate.

We obtained archival data on unit quarterly service performance for a three-year period; frontline employee survey data collection occurred at the midpoint; that is, the archival data covered a year-and-a-half window before and after the survey data collection. This ensured that we captured the downstream effect of unit practice orientations on performance. We systematically removed data for units that were not independent cost centers, reorganized or merged with other units, did not have meaningful revenue data, or did not provide complete data on all required measures for computing unit revenue and efficiency. After matching the individual frontline employee and unit-level data, we had complete observations for 423 frontline employees in 30 units, which we retained for the unit revenue and efficiency

<table>
<thead>
<tr>
<th>Age (in Years)</th>
<th>%</th>
<th>Education</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25</td>
<td>6.0</td>
<td>High school</td>
<td>2.2</td>
</tr>
<tr>
<td>25–35</td>
<td>32.9</td>
<td>Technical certification</td>
<td>9.0</td>
</tr>
<tr>
<td>36–45</td>
<td>27.3</td>
<td>Associate degree</td>
<td>43.8</td>
</tr>
<tr>
<td>46–55</td>
<td>24.9</td>
<td>Some college</td>
<td>8.3</td>
</tr>
<tr>
<td>56–65</td>
<td>7.9</td>
<td>College</td>
<td>30.7</td>
</tr>
<tr>
<td>&gt;65</td>
<td>1.0</td>
<td>Graduate school</td>
<td>6.0</td>
</tr>
</tbody>
</table>

TABLE 1
Demographic Profile of Employees from Participating Service Organization (All Numbers Are Percentages)

<table>
<thead>
<tr>
<th>Tenure (in Years)</th>
<th>%</th>
<th>Salary (in $/Year)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2</td>
<td>16.7</td>
<td>&lt;10,000</td>
<td>6.4</td>
</tr>
<tr>
<td>2–5</td>
<td>23.6</td>
<td>10,000–29,999</td>
<td>29.8</td>
</tr>
<tr>
<td>6–10</td>
<td>12.7</td>
<td>30,000–49,999</td>
<td>50.2</td>
</tr>
<tr>
<td>11–15</td>
<td>15.8</td>
<td>50,000–69,999</td>
<td>13.4</td>
</tr>
<tr>
<td>16–20</td>
<td>8.8</td>
<td>70,000–89,999</td>
<td>.2</td>
</tr>
</tbody>
</table>
analysis. We obtained customer satisfaction data through a marketing research company that continuously measures customer satisfaction through exit surveys. Complete customer satisfaction data were available for the customers of 10 units with 193 frontline employee observations.

Measurement and Operationalization

Productivity and quality orientations. Employees provided key informant data on management’s productivity and quality orientations. We used four items to measure productivity-oriented management practices (PROD) in the unit: (1) Management decisions reflect serious intentions to improve hospital productivity (mgmt1), (2) management urges employees to cut hospital costs (mgmt2), (3) employees are expected to focus on increasing efficiency (mgmt3), and (4) enhancing organizational productivity is a priority for the management (mgmt4). Scale validation testing resulted in the dropping of one item (mgmt1). Likewise, we measured quality-oriented management practices (QUAL) with four items: (1) Management places the highest priority on delivering the best-quality care (mgmt5), (2) management views medical errors as opportunities to improve the quality of medical care (mgmt6), (3) management focuses on ensuring the highest levels of patient satisfaction (mgmt7), and (4) management views patient complaints as opportunities to improve future patient satisfaction (mgmt8). We used a five-point Likert scale that ranged from “strongly disagree” to “strongly agree.” The reliabilities of the productivity and quality orientations were .83 and .88, respectively.

Constructs comprising the frontline unit mechanism. We measured unit autonomy (AUT) with a three-item, five-point Likert scale. We derived this measure from Hackman and Oldham’s (1976) job diagnostic survey scale, which has received wide attention in the marketing literature (e.g., Singh 1998). Employees indicated their agreement or disagreement regarding whether they had (1) the freedom to do their job in the way they thought best (auto1), (2) opportunities to do whatever was needed to provide quality patient care (auto2), and (3) activities that allowed for independent thought and action (auto3). We also assessed unit cohesion (COH) with a three-item, five-point Likert scale that was based on the group cohesiveness scale that Beehr (1976) developed. Employees indicated their agreement or disagreement with the following statements: (1) Employees have a shared sense of community and purpose (coh1), (2) one can count on assistance from fellow employees (coh2), and (3) one can trust coworkers to lend a hand in need (coh3). Subsequent analysis resulted in the dropping of one item (coh1). For performance feedback (FEED), employees rated the following three items using a five-point Likert scale that ranged from “never” to “very frequently”: (1) Managers provide useful feedback to individual employees (feed1), (2) managers discuss methods for improving individual performance (feed2), and (3) managers provide data on individual performance (feed3). The reliabilities for the autonomy, cohesion, and feedback scales were .87, .94, and .96, respectively.

Unit service performance. We used two measures of unit performance—revenue (REVE) and cost efficiency (COST)—that were based on longitudinal unit-level quarterly archival data provided by each hospital for the period January 2000–December 2002. We computed REVE as follows:

(1) \[ \text{REVE}_t = \frac{\text{Unit gross revenue}}{\text{Unit equivalent patient days}} \]

where \( t \) indexes the revenue for any given quarter and REVE estimates the revenue generated from one equivalent patient day. We computed equivalent patient day for each unit by estimating the following proportion: unit total gross patient revenue/hospital gross revenue per equivalent patient day. In turn, the hospital gross revenue per equivalent patient day is as follows: [total gross inpatient revenue/ (number of inpatients \times length of average inpatient stay)]. Hospitals routinely use the unit equivalent-patient-day measure to assess performance across units (both inpatient and outpatient units) and to determine unit-specific budgets.

In addition, we computed a measure of unit efficiency as a ratio of the cost of human factors in service delivery to an equivalent patient day. In service organizations, the human capital cost is one of the most significant expenses, and efficiency gains in service delivery flow from incremental reductions in the cost of human factors per equivalent patient day. For interpretability, we reversed the sign of this ratio to obtain a positively increasing scale for efficiency. Similarly, adjusting the cost of human factors by equivalent patient days for a given unit accounts for variations in units’ size, labor intensity, nature of services, patient mix, and other unit-specific factors. Thus, we define unit efficiency as follows:

(2) \[ \text{EFFI}_t = \frac{\text{Total labor cost}}{\text{Unit equivalent patient days}} \]

Although the unit revenue and efficiency measures provide an adjustment for differences in unit characteristics, we performed additional analysis to rule out the potentially confounding effects of unobservable variables. Specifically, beginning with the adjusted quarterly time-series data for REVE\(_t\) and EFFI\(_t\) for each unit, we used econometric procedures to extract the variability arising from autocorrelation and seasonality effects. To control for the effects of unobservable variables, we modeled a first-order autocorrelation (e.g., Boulding and Staelin 1995; Jacobson 1990) and included a fourth-difference term for seasonality effects. Thus, we estimated the following time-series cross-sectional models for each unit \( j \):

(3) \[ \text{REVE}_t = \beta_0 + \beta_1 \text{REVE}_{t-1} + \beta_2 \text{REVE}_{t-4} + \epsilon_t, \]

and

(4) \[ \text{EFFI}_t = \lambda_0 + \lambda_1 \text{EFFI}_{t-1} + \lambda_2 \text{EFFI}_{t-4} + \xi_t, \]

where \( t \) represents time (range: 1–12) and REVE and EFFI represent unit revenue and efficiency, respectively, as we calculated previously. Consistent with prior research,

3 We analyzed the data after omitting auto2 because of a reviewer’s concern about potential confounding with quality orientation. The pattern of results remained the same, as we show subsequently.

4 As an additional analysis and check, we modified Equations 3 and 4 to capture only “downstream” data by including a dummy
(Bayus, Erickson, and Jacobson 2003), we retained $\beta_0$ and $\lambda_0$ as the corrected estimates of unit revenue and efficiency for use in testing the hypotheses, as follows:

(5) \[ \text{REVE}_t = \beta_0, \]  
(6) \[ \text{EFF}_t = \lambda_0. \]

We derived customer satisfaction (CS) for each of the ten units from the unit-level quarterly satisfaction data for the same three-year period as the financial data. We used patients’ responses to the question “Overall, how would you rate the care you received at the unit?” to compute the customer satisfaction score. The patients responded using a five-point Likert scale that ranged from “poor” to “excellent.” We derived the customer satisfaction index by the following procedures: For each quarter $t$, we computed a mean score Satisfaction based on the patients’ rating on the overall care they received in the unit:

(7) \[ \text{Satisfaction}_t = \frac{1 \times X_{1t} + 2 \times X_{2t} + 3 \times X_{3t} + 4 \times X_{4t} + 5 \times X_{5t}}{X_{1t} + X_{2t} + X_{3t} + X_{4t} + X_{5t}}, \]

where $t$ represents time (quarter) and ranges from 1 to 12; 1, 2, 3, 4, and 5 represent the categories “poor,” “fair,” “good,” “very good,” and “excellent,” respectively; and $X_{1t}$, $X_{2t}$, $X_{3t}$, $X_{4t}$, and $X_{5t}$ represent the frequency of the category indicated in the subscript at time $t$, respectively. Finally, we derived the customer satisfaction indicator (CS) for each unit by averaging the satisfaction rating across the 12 quarters:

(8) \[ \text{CS} = \frac{1}{12} \sum_{t=1}^{12} \text{Satisfaction}_t. \]

**Method of Analysis**  
The analytical approach involved measurement assessment of the key constructs and testing the hypothesized model.

Table 2 summarizes the key descriptive statistics for the studied constructs.

***Measurement analysis.*** We used standard confirmatory factor analysis procedures to assess the psychometric properties of the key constructs at the unit level. We explicitly focused on the evidence for the convergent and discriminant validity of the study constructs.

**Hypothesized model analysis.** To test the hypotheses, we estimated the proposed model and a rival model that omitted the unit mechanisms. The rival model was a direct-effects model in which unit strategic orientations are posited to influence service performance directly, in accordance with prior research. To account for the multilevel structure of the data (frontline employees nested within units) and model individual unobserved heterogeneity, we used a random-parameters model (Greene 2007), which allows for between- and within-unit effects. Thus, this method enables us to capture the effects of the hypothesized variables (i.e., frontline autonomy, unit cohesion, and feedback) on performance outcomes by modeling parameter heterogeneity.

Table 2 summarizes the key descriptive statistics for the study constructs.

<table>
<thead>
<tr>
<th>Construct</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Quality orientation</td>
<td>.83</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.60</td>
<td>.75</td>
</tr>
<tr>
<td>2. Productivity orientation</td>
<td>.16</td>
<td>.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.80</td>
<td>.66</td>
</tr>
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<td>3. Unit autonomy</td>
<td>.22***</td>
<td>-.07</td>
<td>.87</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.70</td>
<td>.81</td>
</tr>
<tr>
<td>4. Unit cohesion</td>
<td>.17</td>
<td>-.02</td>
<td>.24**</td>
<td>.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.87</td>
<td>.97</td>
</tr>
<tr>
<td>5. Performance feedback</td>
<td>.33**</td>
<td>.02</td>
<td>.31*</td>
<td>.16</td>
<td>.96</td>
<td></td>
<td></td>
<td></td>
<td>3.01</td>
<td>.50</td>
</tr>
<tr>
<td>6. Unit revenue (REVE)</td>
<td>.11</td>
<td>.08</td>
<td>.17</td>
<td>.08</td>
<td>.16</td>
<td>1.00</td>
<td></td>
<td></td>
<td>.02</td>
<td>2.05</td>
</tr>
<tr>
<td>7. Unit efficiency (EFF)</td>
<td>.12</td>
<td>.03</td>
<td>.17*</td>
<td>.07</td>
<td>.18</td>
<td>.18</td>
<td>1.00</td>
<td></td>
<td>.15</td>
<td>1.50</td>
</tr>
<tr>
<td>8. Customer satisfaction (SAT)</td>
<td>-.02</td>
<td>.07</td>
<td>-.13</td>
<td>-.07</td>
<td>-.14</td>
<td>.49</td>
<td>-.46</td>
<td>1.00</td>
<td>4.08</td>
<td>.21</td>
</tr>
</tbody>
</table>

$p < .05$.  
**$p < .01$.  
*Unit revenue, unit efficiency, and customer satisfaction measures are based on actual financial archival data and thus are assumed to have a reliability of 1.

Notes: We estimated all correlations at the unit level after aggregating the individual-level data. Customer satisfaction statistics are based on a subset of units (10) and employees (193).
where i and j denote individual and unit, respectively; AUT = autonomy, COH = cohesion, FEED = feedback, QUAL = quality orientation, and PROD = productivity orientation; the coefficients δij, γij, αij, and θij capture individual-specific unobserved heterogeneity within units; and unij are ~ N(0, σ2) and denote unit-specific variances. Note that the coefficients δij, γij, αij, and θij can change randomly between units because of unobserved within-unit heterogeneity. In turn, ϕn, θn, φn, and τn capture the between-units effects estimated in Equations 9b, 10b, 11b, and 12b, which account for unit-specific variances (unij).

The rival direct-effects model involved the estimation of the following equations:

(13a) REVEij = β0ij + β1jQualij + β2jProdij + β3jProdij × Qualij + υij;
(13b) β0ij = η0n + u0ij;
(14a) EFFIij = η0ij + η1jQualij + η2jProdij + η3jProdij × Qualij + ηij;
(14b) η0ij = ηn + u0ij; and
(15a) SATij = π0ij + π1jQualij + π2jProdij + π3jProdij × Qualij + ζij,
(15b) π0ij = ηn + u0ij.

In estimating the hypothesized and rival models, we were sensitive to multicollinearity issues. Consequently, we used an instrumental variable for quality orientation orthogonal to the other independent variables in the analysis. We also considered the possibility that heterogeneity in employee characteristics influenced the modeled relationships. For example, employees with higher education and work experience tend to be in positions with higher autonomy than those with lower education and work experience. To rule out such alternative explanations, we included several control variables (i.e., income, education level, and work experience) based on prior research that identified these characteristics as influential in group processes and performance outcomes (Campion, Medsker, and Higgs 1993; Gladstein 1984). To the extent that we obtained empirical support for the focal hypotheses after modeling unobserved individual-specific heterogeneity as well as the discussed control variables, our theory is robust to potential alternative explanations.

Results

Measurement Analysis

A confirmatory factor analysis of the study constructs with individual-level data and using the EQS software yielded the following fit statistics (see Table 3): χ^2 = 774.35, d.f. = 105, p = .11; normed fit index = .88; nonnormed fit index = .97; comparative fit index = .98; standardized root mean square residual = .10; and root mean square error of approximation = .07 (90% confidence interval = .00--.11). On statistical, absolute, and relative fit, as well as substantive grounds, the posited measurement model provides a good fit to the data. Table 3 provides further support for the convergent and discriminant validity of the constructs. For example, the estimated loadings for the relationship between individual indicants and their underlying construct are, without exception, large and significant (t-values > 3.5, p < .01). In addition, the reliability estimates are large and significant, ranging from .83 to .95, with an average reliability index of .89, which exceeds the conventional .70 criterion. In terms of discriminant validity, the episodic correlations among the study constructs for individual-level data range from .01 to .81, with none approaching unity. Consistent with this, the 95% confidence intervals for construct correlations do not include unity. In accord with Fornell and Larcker’s (1981) criterion for discriminant validity, the variance extracted exceeds the average variance shared for each study construct. Together, the preceding evidence provides robust support for the convergent and discriminant validity of study constructs.

Hypothesized Model Analysis

Table 4 shows the results of model fit tests and coefficient estimates for the hypothesized and direct-effects (rival) models obtained using the Limdep software. Compared with the null model, the hypothesized model provides a significant improvement in fit for unit revenue (χ^11.d.f. = 41.19, p < .01), efficiency (χ^11.d.f. = 37.31, p < .01), and satisfaction (χ^11.d.f. = 35.94, p < .01), and the rival model is significant for unit revenue (χ^6.d.f. = 14.53, p < .05) but nonsignificant for efficiency (χ^6.d.f. = 9.12, p > .10) and customer satisfaction (χ^6.d.f. = 10.6, p > .10). Furthermore, a nested-model comparison of the hypothesized and direct-effects (rival) models based on the likelihood ratio test indicates that the former provides a significantly superior fit to the data compared with the latter for unit revenue (χ^6.d.f. = 80.78, p < .01), unit efficiency (χ^5.d.f. = 33.54, p < .01), and customer satisfaction (χ^5.d.f. = 84, p < .01). This is also confirmed by the lower Akaike information criterion value in the hypothesized model than the rival model in all three cases. We conclude that frontline autonomy, cohesion, and feedback constitute a regulating mechanism for frontline units and contribute significantly to the model fit and to an explanation of service performance and customer satisfaction.

The mediating role of frontline unit autonomy. In support of H1a and H2a, the results indicate that quality orientation has a significant, positive effect (θ1 = .22, p < .01) and that productivity orientation has a significant, negative effect (θ2 = −.08, p < .01) on perceived autonomy among frontline employees. Furthermore, the quality × productivity interaction term has a significant, positive effect on frontline autonomy (θ3 = .12, p < .01), in support of H3. Finally, in support of H1b and H2b, autonomy has a direct...
positive effect on unit revenue ($\delta_1 = .19, p < .05$) and customer satisfaction ($\alpha_1 = .52, p < .05$) and a negative effect on unit efficiency ($\gamma_1 = -.10, p < .10$).\5

The moderating role of frontline unit cohesion and feedback. Table 4 indicates that unit cohesion has a significant, positive moderating effect on the relationship between frontline autonomy and unit revenue ($\delta_2 = .20, p < .05$) and that between autonomy and customer satisfaction ($\alpha_2 = .35, p < .05$). These results support $H_{4a}$ and $H_{4b}$. However, unit cohesion does not have a significant moderating effect on the relationship between frontline autonomy and unit efficiency ($\gamma_2 = .04, n.s.$), so $H_{4e}$ is not supported. In support of $H_{3a}$ and $H_{3c}$, feedback has a significant, positive moderating effect on the relationship between frontline autonomy and customer satisfaction ($\alpha_3 = .34, p < .05$) and a significant, negative moderating impact on the relationship between autonomy and efficiency ($\gamma_3 = -.18, p > .05$). However, feedback does not have a significant moderating effect on the relationship between frontline autonomy and unit revenue ($\delta_3 = -.07, p > .10$); thus, $H_{3a}$ is not supported.

Direct impact of quality and productivity orientations. To test the validity of the proposed unit mechanism, we also included the direct effects of quality and productivity orientations. Table 4 indicates that productivity orientation has a significant, positive effect on unit revenue ($\beta_2 = .27, p < .01$) but not on unit efficiency ($\upsilon_2 = -.06, p > .10$) or customer satisfaction ($\pi_2 = -.13, p > .10$). Furthermore, quality orientation has no direct effect on unit revenue ($\beta_1 = .12, p > .10$), unit efficiency ($\upsilon_1 = .03, p > .10$), or customer satisfaction ($\pi_1 = .27, p > .10$). The quality $\times$ productivity interaction term is similarly nonsignificant for unit revenue ($\beta_3 = -.04, p > .10$), efficiency ($\upsilon_3 = -.17, p > .10$), and customer satisfaction ($\pi_3 = -.06, p > .10$).

### Discussion

This study identifies a frontline mechanism that mediates the effect of strategic orientation on an SBU’s service outcomes and is instrumental in explaining when and why the simultaneous pursuit of productivity and quality goals results in positive or negative service outcomes. The proposed frontline mechanism, in which frontline autonomy acts as the key mediator and unit cohesion and feedback are salient moderators, is found to be crucial in transmitting the impact of quality and productivity orientations and blunting the productivity–quality trade-offs that result from the pursuit of multiple goals. Thus, our study sheds new light on the link between strategic orientations and service outcomes and introduces a potential mechanism for managing the productivity–quality tension and improving the effectiveness of service companies. Before we discuss these results further, we identify several limitations of our research.

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**TABLE 3**

| Factor Loadings and Measurement Properties of Various Study Constructs |
|-----------------|-----|-----------|------------|--------|
| **Loading**     | **t-Value** | **Reliability** | **Variance Extracted** | **Average R²** |
| Productivity Orientation |          |             |                     |        |
| Mgmt2           | .99     | 7.63       | .83                 | .62    | .31 |
| Mgmt3           | .56     | 3.77       |                      |        |    |
| Mgmt4           | .76     | 5.32       |                      |        |    |
| Quality Orientation |       |             | .88                 | .65    | 36 |
| Mgmt5           | .75     | 5.22       |                      |        |    |
| Mgmt6           | .73     | 5.02       |                      |        |    |
| Mgmt7           | .93     | 7.13       |                      |        |    |
| Mgmt8           | .81     | 5.78       |                      |        |    |
| Unit Autonomy   |          |             | .87                 | .70    | .20 |
| Auto1           | .92     | 6.70       |                      |        |    |
| Auto2           | .84     | 5.92       |                      |        |    |
| Auto3           | .74     | 5.08       |                      |        |    |
| Unit Cohesion   |          |             | .94                 | .88    | .05 |
| Coh2            | .90     | 6.70       |                      |        |    |
| Coh3            | .98     | 7.26       |                      |        |    |
| Performance Feedback |      |             | .95                 | .88    | .28 |
| Feed1           | .90     | 6.88       |                      |        |    |
| Feed2           | .99     | 8.07       |                      |        |    |
| Feed3           | .91     | 6.98       |                      |        |    |

Notes: Loading = standardized coefficient estimate based on the maximum likelihood estimation method using EQS software. t-values greater than 1.96 indicate significant effects at $p = .05$ for a two-tailed test. Composite reliability and variance extracted are based on Fornell and Larcker's (1981) formula. Average $R^2$ is the average variance shared between this construct and all other constructs; it is computed as the mean of squared correlations.
### TABLE 4
Results from Model Comparisons and Parameter Estimation

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Direct-Effects Model</th>
<th>Hypothesized Model</th>
<th>Customer Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unit Revenue</td>
<td>Unit Efficiency</td>
<td>Customer</td>
</tr>
<tr>
<td>Quality orientation</td>
<td>.12</td>
<td>1.29</td>
<td>.03</td>
</tr>
<tr>
<td>Productivity orientation</td>
<td>.27**</td>
<td>2.37</td>
<td>-.06</td>
</tr>
<tr>
<td>Productivity × quality</td>
<td>-.04</td>
<td>1.57</td>
<td>.17</td>
</tr>
<tr>
<td>Unit autonomy</td>
<td>.19*</td>
<td>1.91</td>
<td>-.10*</td>
</tr>
<tr>
<td>Unit cohesion</td>
<td>.18*</td>
<td>1.83</td>
<td>.06</td>
</tr>
<tr>
<td>Performance feedback</td>
<td>-.32***</td>
<td>-3.48</td>
<td>-.11**</td>
</tr>
<tr>
<td>Autonomy × cohesion</td>
<td>.20**</td>
<td>2.23</td>
<td>.04</td>
</tr>
<tr>
<td>Autonomy × feedback</td>
<td>-.07</td>
<td>-.73</td>
<td>-.18**</td>
</tr>
<tr>
<td>Income</td>
<td>.05</td>
<td>.68</td>
<td>.08</td>
</tr>
<tr>
<td>Years of education</td>
<td>-.03***</td>
<td>-3.67</td>
<td>-.01</td>
</tr>
<tr>
<td>Work experience</td>
<td>.10</td>
<td>1.51</td>
<td>-.00</td>
</tr>
</tbody>
</table>

| Nᵣ, Nᵣ | 423, 30 | 423, 30 | 193, 10 | 423, 30 | 423, 30 | 423, 30 | 193, 10 |
| Log-likelihood         | -751.36 | -782.26 | -579.18 | -1074.71 | -710.97 | -765.49 | -537.18 |
| Likelihood ratio test (d.f.) | 14.53 (6) | 9.12 (6) | 10.6 (6) | 68.20 (6) | 41.19 (11) | 37.31 (11) | 35.94 (11) |
| Akaike information criterion | 2.44 | .82 | 2.10 | .38 | 1.09 | .60 | 1.82 |

*Significant at the .1 level.
**Significant at the .05 level.
***Significant at the .01 level.
First, the small sample size for the unit revenue and efficiency models has the potential to reduce statistical power and inflate Type II errors. To address this issue, we conducted analysis on longitudinal performance within units to derive appropriate performance indexes that increase the ability to detect a signal in the subsequent structural estimation of the model. Overall, we obtained statistical support for seven of the nine hypotheses, which alleviates concerns of inadequate power. Nevertheless, the small sample size warrants future replication and validation studies. Furthermore, customer satisfaction data were available only for 10 of the 30 SBUs. Empirically, we employ 193 data points for estimation, and the results indicate that the model explains a significant amount of the variation in customer satisfaction and provides statistical support for all hypotheses. Substantively, we suggest caution in generalizing the findings beyond the study setting at this time. Balancing the demands of multilevel data collection (involving individual frontline employee and unit-level data) with the study objectives, we believe that insights obtained are reasonable as an initial step in understanding the proposed frontline mechanism. Further testing with larger samples and different settings would be instrumental in generalizing the results. Second, we suggest caution against generalizing our findings beyond health care service organizations at this time. Although we expect that a comparable pattern of effects will emerge in other service contexts, validation in different settings is needed. Third, we recognize that other unmeasured variables may be involved in the proposed frontline unit mechanism. We reason that to the extent such variables are correlated with the control variables in our analysis and/or uncorrelated with the focal variables, our results are likely robust. In addition, we controlled for individual unobserved heterogeneity, which alleviates concerns of bias due to omitted interacting variables. Finally, the inclusion of autocorrelation specification in our estimations addresses the contemporaneous correlation problem in business performance models (Jacobson 1990). Nevertheless, our proposed model invites inclusion of other theoretically grounded mechanisms to map the generalizability and to extend the applicability of our findings.

Limited Direct Effects of Quality and Productivity Orientations on Service Performance

Prior research has focused mainly on the direct effects of strategic orientations on such unit outcomes as financial performance and has found supporting evidence (Gatignon and Xuereb 1997; Rust, Moorman, and Dickson 2002; Voss and Voss 2000). Our findings clarify and define the limits of this body of work by demonstrating that the direct effects will emerge in other service contexts, validation in different settings is needed. Third, we recognize that other unmeasured variables may be involved in the proposed frontline unit mechanism. We reason that to the extent such variables are correlated with the control variables in our analysis and/or uncorrelated with the focal variables, our results are likely robust. In addition, we controlled for individual unobserved heterogeneity, which alleviates concerns of bias due to omitted interacting variables. Finally, the inclusion of autocorrelation specification in our estimations addresses the contemporaneous correlation problem in business performance models (Jacobson 1990). Nevertheless, our proposed model invites inclusion of other theoretically grounded mechanisms to map the generalizability and to extend the applicability of our findings.

Influence of Frontline Mechanisms Based on Autonomy, Cohesion, and Feedback

Our results support the theory that frontline mechanisms play a crucial role in linking an SBU’s strategic orientations and service outcomes. Specifically, unit autonomy acts as a key mediator in translating productivity and quality orientations into unit revenue, unit efficiency, and customer satisfaction. Consistent with our expectations, we found that high cohesion, high feedback (both +2 SD), and low cohesion, low feedback (both +2 SD) are likely to be limited after we account for a frontline unit mechanism. The total marginal effect of quality orientation on unit revenue, given high levels of productivity orientation (+2 SD), is $\frac{\partial \text{REV}}{\partial \text{Qual}} = -0.47 + 0.16 \times \text{Coh} + 0.16 \times \text{Feed}$. Thus, depending on the level of frontline unit cohesion and performance feedback, the effect of quality orientation on customer satisfaction ranges from −1.11 for low cohesion and low feedback (both −2 SD) to +1.7 for high cohesion and high feedback (both +2 SD). Furthermore, the effect of quality orientation on unit revenue becomes positive as a result of managing the simultaneous emphasis on quality and productivity orientation through the proposed frontline mechanism. The total marginal effect of quality orientation on unit revenue, given high levels of productivity orientation, is captured by $\frac{\partial \text{REV}}{\partial \text{Qual}} = 0.08 + 0.08 \times \text{Coh}$ and ranges from −0.08 for low cohesion to +0.24 for high cohesion.

These findings have several implications. First, they suggest that the results of studies that focus on the simple direct effects of strategic orientations on SBU outcomes are likely to be incomplete, if not misleading, as long as the indirect and mediated effects are omitted. Second, the results indicate that consideration of a mediating frontline mechanism enhances understanding of the influence of productivity and quality orientations. Third, they suggest that whether the simultaneous adoption of productivity and quality orientations increases unit revenue and customer satisfaction depends less on the intensity with which the orientations are adopted and more on the amplifying and mitigating effects of the frontline mediation mechanism in face-to-face service settings. For example, increasing frontline autonomy can mitigate the negative effect of the simultaneous adoption of productivity and quality orientation on unit revenue. Likewise, together, cohesion and feedback can alter the direction and magnitude of the effects of strategic orientations on important SBU outcomes. Thus, studies that omit frontline mechanisms are likely to produce biased results driven by a contextually unspecified aggregation of mediated and unmediated effects, which will limit their usefulness for managers who want to increase productivity and quality in face-to-face service settings.
associated with it. Furthermore, a simultaneous emphasis on quality and productivity has an incremental positive association with frontline autonomy. Finally, frontline autonomy has a significant, direct positive effect on unit revenue and customer satisfaction but a significant, negative effect on unit efficiency.

Several implications follow from these results. A greater emphasis on a quality orientation or a dual (quality and productivity) orientation is associated with increased frontline unit autonomy, whereas a greater emphasis on a productivity orientation is associated with lower levels of frontline autonomy. This is consistent with the notion that managers attempt to match the autonomy afforded to the front lines with the service demands of the job. The more autonomous units tend to achieve higher revenue but lower efficiency than units with lower levels of autonomy.

Our results pinpoint the locus of productivity–quality trade-offs in frontline autonomy. When guided by a quality orientation, units design frontline work for increased autonomy to gain unit revenue advantages, but in the process, they incur efficiency losses. In contrast, when guided by a productivity orientation, units design frontline work to limit autonomy, which results in increased efficiency but also significant revenue loss. A dual emphasis on both quality and productivity orientations is predictable related to autonomy and that autonomy is linked to unit revenue, efficiency, and customer satisfaction, our results highlight the theoretical and pragmatic significance of frontline mediating mechanisms in face-to-face service settings.

In addition, our findings suggest that unit cohesion has a significant moderating effect on the frontline autonomy–performance link. We expected that unit cohesion would increase commitment to shared goals and unit members’ tendency to self-regulate their collective behavior. Our results show that unit cohesion amplifies the positive impact of frontline autonomy on both unit revenue (slope changes from −.21 to .59) and customer satisfaction (slope changes from −.18 to 1.22; see Panel A of Figure 2 and Figure 3, respectively).

However, unit cohesion does not simultaneously increase the negative impact of autonomy on unit efficiency, which we also expected. This suggests that building unit cohesion in the front lines can help partly mitigate the inherent trade-offs in pursuing both quality and productivity orientation because it can enhance the positive mediation effects of autonomy on unit revenue and customer satisfaction without amplifying the negative mediation effect on unit efficiency. Importantly, maximal benefits from unit cohesion can be obtained only in the presence of frontline autonomy. Overall, these results suggest that the unit cohesion mechanism is important for building organizational capabilities that allow for the successful pursuit of multiple orientations.

Finally, we expected that performance feedback would moderate the autonomy–performance relationship and found mixed evidence. Feedback amplifies frontline autonomy’s positive effect on customer satisfaction (slope changes from −.16 to 1.20) and its negative effect on unit efficiency (slope changes from −.26 to −.46; see Panel B of Figure 3 and Figure 4, respectively). However, feedback has no significant moderating effect on the autonomy–unit revenue relationship (see Panel B of Figure 2). Thus, the interaction between frontline autonomy and performance feedback accentuates the customer satisfaction–efficiency trade-off. We reasoned that the influence of performance

---

**FIGURE 2**

Moderating Effects of Unit Cohesion and Performance Feedback on Frontline Autonomy \( \rightarrow \) Revenue

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="High cohesion" /></td>
<td><img src="image2.png" alt="Low feedback" /></td>
</tr>
<tr>
<td><img src="image3.png" alt="Low cohesion" /></td>
<td><img src="image4.png" alt="High feedback" /></td>
</tr>
</tbody>
</table>

Notes: Panel A: The total effect of frontline autonomy on unit revenue is enhanced by the high versus low cohesion (\(\pm 2\ SD\)). The equations plotted are as follows: Unit revenue = \(-.36 - .21 \times \) frontline autonomy (low unit cohesion), and unit revenue = \(.36 + .59 \times \) frontline autonomy (high unit cohesion). Panel B: The total effect of frontline autonomy on unit revenue results in a smaller intercept for high versus low feedback (\(\pm 2\ SD\)) but equivalent slopes. The equations plotted are as follows: Unit revenue = \(.64 + .19 \times \) frontline autonomy (low feedback), and unit revenue = \(-.64 + .19 \times \) frontline autonomy (high feedback).
反馈在自主权的背景下会根据前线员工的共同目标进行调整。在面对面的服务环境中，前线员工和他们的组织在追求质量目标时保持一致，但在优先级上有所不同（例如，Weinberg 2003）。与之相符，反馈增强了目标的执行效果（例如，质量通过自主权）和无效效果。
effect of the misaligned goal (e.g., productivity through autonomy). In the absence of frontline autonomy, feedback has a negative effect on both unit revenue and unit efficiency in face-to-face service settings.

Managerial Implications and Concluding Notes

For managers who want or need to pursue strategic goals of productivity and quality simultaneously, our study offers some useful insights into managing the strategic dilemmas that stem from multiple goal pursuit in face-to-face service settings. First, while providing support for previous research that suggests inherent trade-offs in the simultaneous pursuit of productivity and quality goals (Anderson, Fornell, and Rust 1997; Rust, Moorman, and Dickson 2002; Singh 2000), our study shows that a consideration of unit mechanisms is necessary to understand fully the scope of these trade-offs. The magnitude of productivity–quality trade-offs does not simply depend on the intensity with which managers pursue these strategic orientations. Rather, the trade-offs are significantly amplified or mitigated by unit-level frontline mechanisms involving autonomy, cohesion, and feedback. For example, a clear and compelling finding of our study is that, together, frontline autonomy, cohesion, and feedback can bolster the influence of quality orientation by a factor equivalent to 1.25 standard deviations for customer satisfaction (e.g., from −1.11 to +1.17) and more than .30 standard deviations for unit revenue (e.g., from −.08 to +.24). Based on current revenue data, a change of .30 standard deviations corresponds to incremental yearly revenue of more than $20 million for an SBU with 20 patients on the average per day.6 Likewise, a change of 1.25 standard deviations in customer satisfaction scores can make the difference between acceptable and excellent service performance. The influence of frontline mechanisms is significant.

Second, although managers risk productivity–quality trade-offs when they design frontline jobs for autonomy, unit cohesion and performance feedback work to modulate the nature and degree of such trade-offs. For example, increased unit cohesion potentially eliminates the productivity–quality trade-off effect for unit revenue (e.g., from −.08 to .24) and substantially diminishes the trade-off for customer satisfaction (e.g., from −.79 to −.32), while leaving the effect on unit efficiency unaltered. However, although increased feedback weakens the impact of the productivity–quality trade-off on customer satisfaction (e.g., from −.79 to −.15), it amplifies the trade-off effect for unit efficiency (e.g., from −.38 to −.70).7 Overall, consider-

3We computed this value on the basis of archival revenue data. A .30 standard deviation change in revenue corresponds roughly to $2,762 per patient day. Multiplying this by 20 patients and 365 days results in the value noted.

4The effects are computed on the basis of the marginal effect of quality orientation, given high levels (+2 SD) of productivity orientation.

Appendix

Using the D Statistic to Assess Employee–Manager Goal Incongruence

Unit managers and employees were asked to rate from 1 (“less important”) to 5 (“extremely important”) three quality-related goal items—(1) highest quality of patient care, (2) highest level of customer satisfaction, and (3) eliminating medical errors—and three productivity related goal items—(1) maximizing unit efficiency, (2) delivering cost efficient patient care, and (3) meeting productivity target.
Next, following Cronbach and Gleser (1953), we computed goal incongruence by estimating the D statistic as follows:

$D_i = \frac{1}{2 \kappa} \sum_{k=1}^{\kappa} (X_{ik} - Y_k)^2,$

where $X_{ik}$ represents the rating scores by employee $i$ on the $k$th measure and $Y_k$ represents the corresponding rating by the unit manager. Higher values of $D_i$ indicate greater incongruence.

After we calculated the individual $D_i$, we calculated the mean $D_i$ as the indicator of employee–manager goal incongruence separately for productivity and quality goals for each unit:

$$D = \frac{1}{n} \sum D_i,$$

where $n$ is the number of employees within each unit.

Analyzing the $D$ scores produced the following statistics:

- Quality goal incongruence: $M = .50$, $SE = .06$.
- Productivity goal incongruence: $M = 2.03$, $SE = .09$.
- Comparison of productivity and quality goal incongruence: $t = 13.12$, d.f. = 46, $p < .01$.

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