

COMMENTARY

## Strategic Cost Management in Supply Chains, Part 2: Executional Cost Management

Shannon W. Anderson and Henri C. Dekker

**SYNOPSIS:** *Strategic cost management* is the deliberate alignment of a firm's resources and associated cost structure with long-term strategy and short-term tactics. Although managers continue to pursue efficiency and effectiveness within the firm, increasingly, improvements are obtained across the value chain, through reconfiguring firm boundaries, relocating resources, reengineering processes, and reevaluating product and service offerings in relation to customer requirements. The first paper in this two-part series reviewed structural cost management in supply chains (Anderson and Dekker 2009). *Structural cost management* employs tools of organizational design, product design, and process design to create a supply chain cost structure that is coherent with firm strategy. In this second paper of the series we consider executional cost management in supply chains. *Executional cost management* employs measurement and analysis tools (e.g., cost driver analysis, supplier scorecards) to evaluate supply chain performance and sustainability. Using selected studies in accounting, operations management, and business strategy, we provide an overview of strategic cost management in supply chains, highlight contemporary developments, and suggest directions for future research.

**Keywords:** interorganizational; supplier; supply chain management; value chain.

### INTRODUCTION

Increasingly, purchased materials and services account for a significant share of the cost of firms' products and services. As a result, managers are devoting more attention to developing strategies for managing complex supply chains. Strategic cost management, the deliberate alignment of a firm's resources with long-term strategy and short-term tactics, is critical to managing the supply chain and delivering performance for all firms in the value chain (Aberdeen Group 2005). In a recent survey, managers report that increasing complexity of products and services, increasing and increasingly volatile input prices (e.g., wages, fuel), and the availability of sophisticated supply chain management tools have influenced their supply chain strategies (McK-

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insey & Company 2008, 3–4). The overwhelming response to these influences is a renewed focus on increasing the effectiveness with which supply chains provide low-cost, high-quality products and services with speed and reliability, and on evaluating supply chain risk—all elements of what we term *executional cost management*.

This paper is the second in a two-part series that examines contemporary research in strategic cost management in supply chains. We employ an organizing framework from Anderson (2007) that incorporates Shank and Govindarajan's (1992, 1994) notions of structural and executional cost drivers as well as a value chain perspective. In the first paper in the series, (Anderson and Dekker 2009), we focus on structural cost management decisions related to sourcing, supplier selection, the design of supplier relationships, and joint activities of buyers and suppliers in product and process design. In this paper, we take up executional cost management of buyer-supplier relationships, which includes assessing transaction-level and relationship-level performance as well as assessing the sustainability of the supply partnership in the context of the full value chain.

We begin with a review of the organizing framework that was presented more fully in the first paper in the series. Then we turn to the two major components of executional cost management: (1) measuring, evaluating, and improving supply chain transactions and relationships, and (2) assessing supplier health and the long-term sustainability of supply relationships. We conclude with a brief summary of the two-part series and a discussion of how recent developments in strategic cost management in supply chains presage opportunities for accounting education.

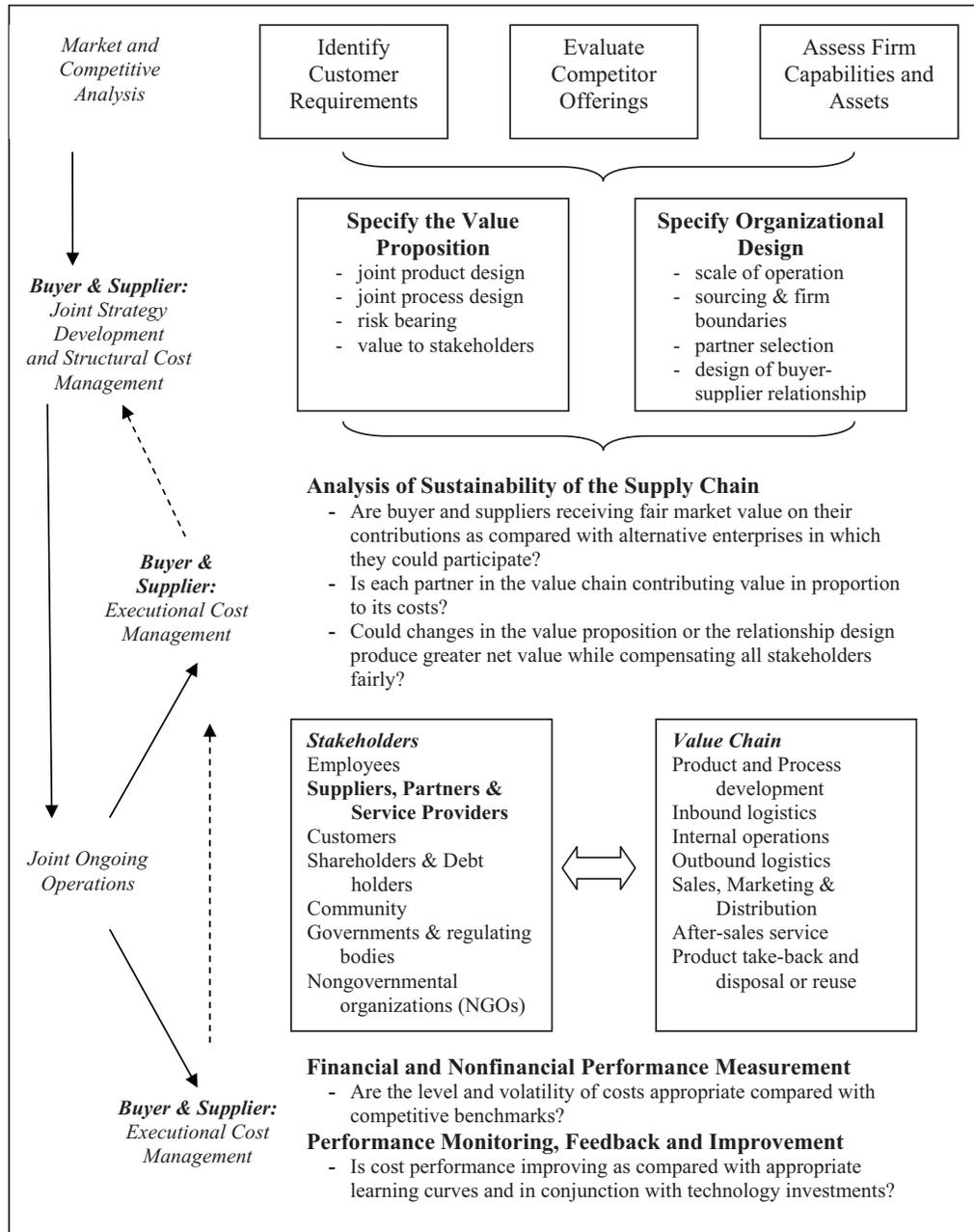
### STRATEGIC COST MANAGEMENT

Shank and Govindarajan (1992, 1994) posit that two types of cost drivers are the basis for strategic cost management: *structural cost drivers* that reflect organizational structure, investment decisions, and the operating leverage of the firm; and *executional cost drivers* that reflect the efficacy and efficiency of executing the strategy. Stated differently, structural cost management may be conceived of as a choice among alternative production functions that use different inputs or combinations thereof to meet a particular market demand. Executional cost management is concerned instead with whether, for a given production function, the firm is on the efficient frontier. Tomkins and Carr (1996, 276) link the two modes of cost management, positing that cost driver analysis is a catalyst for improving existing processes (i.e., executional cost management) as well as a catalyst for reengineering processes to create a *different* cost structure (i.e., structural cost management).

Figure 1 depicts the interplay between market and competitive analysis, strategy development and structural cost management, and executional cost management. Taking up Porter's (1985) emphasis on creating competitive advantage throughout the value chain, Shank and Govindarajan (1992, 1994) recognize that the greatest opportunities for cost management are often at the boundaries of the firm. Figure 1 highlights the value chain as the domain for strategic cost management. Although the focus of this series of articles is on cost management between buyers and suppliers, Figure 1 also incorporates Kaplan and Norton's (1996) multi-stakeholder perspective, depicting strategic cost management as influencing and being influenced by a variety of decision makers who are involved directly (e.g., suppliers, customers) and indirectly (e.g., nongovernmental organizations, governments) in the value chain.

In this paper we focus on executional cost management applied to suppliers of direct and indirect materials and services. In this context, executional cost management includes assessing transaction-level and relationship-level performance (bottom of Figure 1) as well as assessing the sustainability of the supply partnership (middle of Figure 1). We consider first the lower portion of Figure 1, the executional cost management activities associated with measuring and evaluating

**FIGURE 1**  
**Strategic Cost Management in Supply Chains**



Adapted from Anderson (2007), which was developed with reference to Tomkins and Carr (1996), Shank and Govindarajan (1992, 1994), and Kaplan and Norton (1996).

performance, and using this information collaboratively to improve performance. We then turn to the broader question of assessing the sustainability of the collaboration strategy. Here we recognize that buyer-supplier collaborations may perform as planned; however, with changing circumstances, collaboration may not be sustainable if either party stands to gain from withdrawing from the relationship or from diminished performance. The iterative nature of strategy development and refinement that unforeseen future events and uncertainty resolution necessitates is depicted in the feedback path between executional and structural cost management.

### EXECUTIONAL COST MANAGEMENT IN SUPPLY CHAINS: MEASURING, MONITORING, AND IMPROVING PERFORMANCE

Executional cost management includes the familiar management accounting elements of measuring and monitoring performance as well as the dynamic use of performance data to improve performance (bottom of Figure 1). Performance measurement systems contribute to performance improvement by clarifying expectations of exchange partners through setting goals, promoting goal-directed behavior, reducing ambiguity about outcomes, and enhancing feedback and learning (Mahama 2006). Although these activities can be challenging within the firm, they are even more complicated between firms. A recent survey identifies sharing knowledge between different locations (within the buying firm and with different suppliers), integrating information technology, and managing communications in a culturally diverse business setting as significant challenges to supply chain management (McKinsey & Company 2008). Clearly, even setting aside conflicting objectives and opportunistic behavior that are ameliorated by structural cost management (described in the first part of this series), we are still left with significant performance management challenges.

When two or more firms transact, significant technical uncertainties can occur in defining and measuring performance and in distinguishing each firm's influence on interdependent outcomes. Indeed, the transaction cost economics literature identifies ambiguities in measuring performance as a central reason why many firms vertically integrate activities that are fraught with measurement difficulties. Ambiguities may arise in what defines performance, how performance is to be measured, and how blame is apportioned in the event of performance failure. As one example, Anderson et al. (2000) provide empirical evidence that product design interdependencies in automotive components influence sourcing decisions and subsequent transaction performance. Technical uncertainties, in combination with physical and temporal separation of the two parties, contribute to and are compounded by communication and coordination failures.

In spite of these concerns, accounting research indicates that performance measurement is an essential component of the supply chain management control structure that is associated with performance (Dekker 2003, 2004; Dekker and Van den Abbeele 2009; Langfield-Smith and Smith 2003; Mahama 2006; Seal et al. 2004; Schmitz and Platts 2004). Ding et al. (2009) find that finance managers frequently report being responsible for facilitating buyer-supplier cooperation through results monitoring, advice, supervision, and involvement in daily operations. To achieve these aims they use frequent, detailed financial and nonfinancial performance information about partner firms. Gunasekaran et al. (2001, 2004) argue that the role of performance measures in the success of collaborative action cannot be overstated because they affect strategic, tactical, and operational planning and control.

This section reviews research and contemporary practices related to financial and nonfinancial performance measurement and to management feedback processes that employ performance measures as a catalyst to continuous improvement.

### Supply Transactions: Financial Performance Measurement

Traditionally, *supplier performance* has had one of two meanings. For the procurement specialist charged with obtaining materials and services at low cost, good supplier performance is a purchase price that is both stable and low. For the manufacturing manager, charged with producing output, good supplier performance is defined by reliability of delivery, accuracy of inventory, and quality (free of defects) of supply. These functional perspectives often result in conflicting assessments of supplier performance, conflict that is frequently reinforced by incentive schemes that reward one function (e.g., purchasing) for taking actions that harm another function (e.g., manufacturing).<sup>1</sup> Alternatives for reconciling these functional perspectives in large decentralized firms include modified incentives and modified decision authority (i.e., structural cost management). As elaborated in the first paper in this series, studies such as [Anderson et al. \(2000\)](#), [Anderson and Lanen \(2002\)](#), [Baiman et al. \(2001\)](#), [Baiman and Rajan \(2002\)](#), [Cachon and Fisher \(2000\)](#), [Cachon and Zipkin \(1999\)](#), and [Gietzmann \(1996\)](#) provide examples of firms using product and process design, inventory ownership and stocking decisions, and unique governance structures and information sharing to align perspectives on supplier performance.

In the context of executional cost management, accounting research has focused on traditional cost accounting and performance measures as causes of the problem. Specifically, management accounting researchers note that the cost that procurement specialists minimize—the purchase price—is incomplete if it excludes “hidden” costs, such as inventory stock-outs, that trouble manufacturing managers. [Carr and Ittner \(1992\)](#) formalize this argument and provide examples of firms that modify their cost accounting systems to assign “total cost of ownership” (TCO) values to suppliers’ products. Their description of the use of TCO in Texas Instruments Corporation shows that significant costs are unrelated to purchase price and relate instead to plant-level activities associated with handling the purchased components. Sun Microsystems ([Farlow et al. 1996](#)) translates several nonfinancial dimensions of supplier performance into a financial TCO measure of supplier-performance measure.

Whereas Texas Instruments and Sun Microsystems focus on individual suppliers’ performance, other firms take a broader perspective. For example, [Dekker \(2003\)](#) studies a retail firm that analyzes cost data in its multi-partner value chain. Transaction partners jointly allocate costs from an activity-based costing analysis to supply chain activities that cross firm boundaries. This allows the firms to examine how interdependent decisions are associated with costs to all partners. Thus the retailer has information about the TCO alternatives offered by different suppliers that facilitates “scenario analysis” of changes to the supply chain, and suppliers have the opportunity to benchmark their performance against competitors. Over time, both the retail firm and its suppliers can monitor performance trends. This example illustrates [Porter’s \(1985\)](#) prescription of managing linkages between value-creating activities to improve the value chain’s efficiency and provide competitive returns to all participants. In addition to domestic and global suppliers of purchased materials and services, modern supply chain management comprises contract manufacturers, company-owned product and service centers, third-party logistics providers, and a network of transportation providers ([Trebilcock 2007](#)). A question that has received little attention in the research literature is how these collaborations interact with and are managed alongside more traditional supply relationships.

A challenge of adopting the TCO approach is identifying the “hidden” costs that are associated with a particular supplier. Some firms, like the retailer studied by [Dekker \(2003\)](#) treat the problem as one of cost allocation. They review costs incurred in conjunction with poor supplier

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<sup>1</sup> [Slone et al. \(2007\)](#) and [Narayanan and Raman \(2004\)](#) provide a number of vivid examples of cross-functional disputes that arise when incentives are not aligned to promote smooth functioning of the supply chain.

performance (e.g., overhead costs associated with receiving nonstandard shipments, warranty claims, returns) and assign them, along with the purchase price of the supplier's products and services, to TCO of the supplier. A potential limitation of this approach is the focus on "accounting costs" as compared with "economic costs." Opportunity costs associated with stock out and delayed production are often far greater than the purchase price of materials (Callioni et al. 2005) or the overhead to manage purchased materials. Indeed, in a recent survey (O'Keefe 2004), supply chain managers identify supply interruption caused by supplier failure, logistics failure, a natural disaster, or a geopolitical event as the primary risks that they seek to mitigate.

Although risk mitigation is clearly at the heart of structural cost management (see Anderson and Dekker 2009), we are unaware of any research that addresses how residual risk (risk that remains after adopting management controls) is incorporated into the more routine performance evaluations that executional cost management comprises. Firms such as Sun Microsystems address this concern, in part, by departing from a cost-allocation approach to measuring TCO. They develop an extensive list of performance criteria, each with its own goal and "weight" in the TCO calculation. "Costs" (that are not linked in any way to accounting data) are assessed based on performance-to-goal, and a measure of TCO is obtained by summing across the goals. Additional research is needed to identify approaches used by other firms. Moreover, even the Sun Microsystems case does not address whether and how the residual risk associated with a particular supplier influences evaluation of the value chain. In a linked network of suppliers, even a small amount of risk associated with a single supplier quickly propagates throughout the value chain and affects all trading partners.<sup>2</sup> Pernot (2008), for instance, describes how in its "just-in-sequence" system, Volvo Cars Gent is concerned about operational problems at suppliers that disturb supply chain continuity, not only of Volvo's processes, but also of its other suppliers. Volvo developed performance measures, penalty systems, and behavior controls to prevent supplier problems and to efficiently manage problems that arise.

While Sun Microsystems' approach includes economic costs that fall outside the cost accounting system, it introduces subjectivity in the form of goals, a "cost" function for deviation from goal, and a "weight" assigned to each performance criterion. Management accounting researchers have considerable experience with goal setting and the role of subjectivity in evaluations inside the firm; however, to our knowledge no research has examined these issues as they relate to the calculation and subsequent use of TCO data. Anderson et al. (2000) consider how a contracting approach that incorporates subjectivity by the buyer in evaluating successful job completion by the supplier affects the relationship between transaction hazards and the buyer's decision. Drake and Haka (2008) and Van den Abbeele et al. (2009) examine the role of TCO and detailed activity-based costing data in buyer-supplier negotiation outcomes. Wouters et al. (2005) find that adoption of TCO is associated with assessments of information adequacy. Taken together, these studies suggest that the mode of calculating TCO, its use in negotiations, and its use as a benchmark for evaluating successful completion of transactions could materially affect buyer-supplier relations and negotiated outcomes. In addition to information adequacy, Wouters et al. find that TCO adoption is influenced by economic factors (e.g., market competition) and behavioral factors (e.g., top management support, commitment of functional managers to using the data, incentives to use the information). Thus, like earlier research on the antecedents of activity-based costing adoption

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<sup>2</sup> In a contemporary example (Reitman 1997), Toyota Motor Company was forced to idle most of its 20 automobile assembly plants following a fire at the sole factory of a supplier that produced a valve that regulates brake fluid. Toyota had virtually no inventory of parts because its suppliers deliver several times a day according to a just-in-time schedule of production. This isolated event also idled many of Toyota's other suppliers.

and use (Anderson 1995; Anderson and Young 1999), TCO is shown to be a socio-technical system in which interactions between technical features and behavioral factors jointly determine successful outcomes.

Wouters et al. (2005) collect survey data from firms that employ TCO to evaluate the hidden costs of suppliers. Two interesting unanswered research questions are whether suppliers are equally likely to embrace TCO as a measure of their own performance and whether suppliers perform a parallel analysis of evaluating the “cost of customers” (COC) (Foster and Gupta 1994; Foster et al. 1996) of their key buyers. In the case of Sun Microsystems (Farlow et al. 1996), suppliers are reported to incorporate Sun’s estimate of TCO into their own internal pay-for-performance plans, suggesting that suppliers believe that TCO is a performance measure that aligns their incentives with Sun’s objectives. However, it is not difficult to identify cases where that would not be true. For example, Anderson et al. (2000) find that suppliers delay submitting auto parts for evaluation, fearing that early submissions invite the misuse of subjectivity in judging parts to be acceptable.

In a more recent study of a new product development setting, Wouters et al. (2008) argue that firms often find all-encompassing analyses of cost and performance, such as TCO, difficult to implement because of the high complexity of cost modeling and the requirements related to time, data, and cooperation. They examine a less demanding method, termed “monetary quantification of points of difference,” of analyzing the effects of purchasing on cost and performance. Using this method, product development teams translate differences on performance attributes of supplier offerings into monetary units of measure, excluding points of parity that do not drive differences in supplier evaluations and sourcing. This method requires less time, cooperation, and data than a full-cost analysis and focuses on critical, differentiating features of suppliers’ products.

In sum, research is emerging on TCO as an innovation in cost analysis. However, many interesting questions remain. Three particularly fertile areas for future research are examining how TCO information developed by buyers is used by (or with) suppliers, comparing TCO calculations with COC calculations to determine whether the perspectives of buyers (TCO) and suppliers (COC) yield convergent solutions for optimizing the value chain, and identifying examples of how firms define TCO to incorporate opportunity costs and to reflect residual risk and uncertainties that may affect both the level and volatility of cost for a supplier and for the supply chain as a whole.

### **Supply Transactions: Nonfinancial Performance Measurement**

Many firms realize the importance of using both financial and nonfinancial measures to create a more “balanced” approach to supplier performance measurement (Gunasekaran et al. 2001, 2004). Indeed, even firms that do not employ financial measures of supplier performance typically measure nonfinancial performance such as on-time delivery, inventory accuracy, and quality. With the advent of nonfinancial metric systems such as the balanced scorecard (Kaplan and Norton 1996), firms have developed “supplier scorecards” to support supply chain management strategy. In the example described earlier, Sun Microsystems calculates a supplier’s TCO on the basis of performance against nonfinancial performance goals (Farlow et al. 1996). In other cases, the scorecard is a collection of financial and nonfinancial metrics that are weighted to create a composite supplier rating (e.g., Federal Mogul’s scorecard: <http://www.federal-mogul.com/en/Suppliers/SupplyNet/Scorecard/>). In a recent survey of what firms measure (Aberdeen Group 2005), the top four measures are on-time delivery, quality, service, and price. More than 25 percent of firms that measure supplier performance also measure compliance with contract terms, responsiveness, lead time, technical capability, environmental and safety performance, and innovation.

Although supplier scorecards are becoming more common, the same survey (Aberdeen Group 2005) finds that nearly half of all firms surveyed had no formal practices of measuring supplier

performance and that a matched sample of firms that did use formal supplier performance measures outperformed those that did not on price, delivery, quality, and service. Of course we cannot conclude causality from this study, because the firms that decided to adopt supplier performance measurement systems may have performed better before the adoption as well. Additional provocative results of this survey indicate that firms that have measured suppliers for more than 18 months perform better than those with newer systems; that firms that standardize the supplier-performance measures at the business unit level perform better than those that employ firm-wide standardization; and that firms that measure the performance of 25 percent or more of their suppliers perform better than those that do so for a smaller portion of the supply base. Again, competing explanations exist for these data, which only points to the necessity for more research on the subject.

A careful longitudinal research study or an experimental design would be needed to more clearly identify whether the use of a scorecard of supplier performance measures is the basis for improved supplier performance. Extant research on the valuation implications of adopting activity-based costing (Ittner et al. 2002) and on how the balanced scorecard affects management decision making inside the firm (Lipe and Salterio 2000) indicates that these lines of inquiry could be productively extended to supplier performance measurement. Moreover, it seems likely that the interfirm setting, in which buyers and suppliers jointly interpret the data to identify improvement opportunities, could produce somewhat different insights.

### **Supply Transaction Performance: Monitoring, Feedback, and Improvement**

Performance measures are used for monitoring, evaluating, rewarding, and improving performance. We characterize the design of supply chain management control systems as part of structural cost management and focus on the role of performance measures in improving performance when we consider executional cost management. However, the two roles are intertwined. Performance measures that are used to diagnose and improve supply chain performance (i.e., executional cost management) can also promote social ties and trust-building that influence partner selection and the design of supplier relationships (i.e., structural cost management). For example, it is common for performance to be shared and deliberated in periodic performance review meetings and joint training programs (Mahama 2006). Langfield-Smith and Greenwood (1998) provide an early example of how Toyota Australia introduced supplier assessments, involving continuous and integrated performance measurement on a range of financial and nonfinancial measures (including quality, delivery, price, best practice manufacturing, and other areas) and a supplier-development program to improve relations with suppliers and ultimately supplier performance.

In a recent survey of how supplier performance measurement systems are used (Aberdeen Group 2005), managers identified improving supplier performance (85 percent of respondents), evaluating supplier risk (70 percent), stimulating supplier development (50 percent), and predicting supplier performance (35 percent). Together these point to both diagnostic and interactive uses of supplier-performance measures. Other important uses included supplier selection, consolidation of the supply base, and segmenting the supply base; indicating another way that performance measures become feedback for future structural cost management decisions related to sourcing, supplier selection, and organizational design. In one of the earliest studies of supply chain management, Lorenzoni and Baden-Fuller (1995) conclude that the best performing supply networks were characterized by the presence of performance measurement systems and interactive processes for sharing performance data and diagnosing problems. Consistent with evidence from the Aberdeen Group survey, they identified investments in controls and information systems as critical to well-functioning networks.

Performance measures serve an important role in improving supplier performance because they are an important means of clearly communicating performance expectations and realizations.

Prahinski and Benton (2004) examine supplier evaluations as part of supplier-development programs. They argue that buying firms use evaluation processes to determine whether the supply base is capable of meeting their current and future business needs. Quantifying and communicating performance measurements and targets makes suppliers aware of discrepancies between their current performance and the buyer's expectations, and creates a basis for discussing strategies for improvement. In their study of four large automotive companies, Schmitz and Platts (2004) conclude that the ongoing measurement of first-tier suppliers' logistics performance functions primarily as a communication tool, enhancing communication between the OEM and its suppliers and between individual departments. Mahama (2006) finds the use of financial and nonfinancial performance measurement in strategic supply relationships to relate positively to socialization processes between exchange partners. Specifically, use of performance measures is associated positively with various dimensions of cooperation (information sharing, problem solving, and adaptability to changes) and is also indirectly related to restraint in exploiting market power. Cooperation and restraint in exploiting market power are positively related to supplier performance. Mahama also finds that use of performance measures relates directly to better supplier performance (i.e., cost, quality, time, and improved decision making).

Nonfinancial performance measurement systems also play a role in managing risk in the supply chain. In a recent survey (O'Keefe 2004), managers identify the absence of timely supplier performance measures and "spend analysis" (analysis of total spending by a buyer with a particular supplier) in strategic sourcing decisions as the third most significant source of supply chain risk. In three case studies of strategic alliances (including supply relationships), Anderson et al. (2008) find that diagnostic and interactive controls are widely used (along with boundary controls) to mitigate alliance risk.

Another way in which performance measures are used to improve supplier performance is through benchmarking and "yardstick" competition, in which suppliers with similar characteristics are compared with one another and supplier performance is tracked over time. Benchmarking can help firms identify shortcomings and provide a means for learning and feedback. As the name implies, "yardstick" competition can keep suppliers focused on their value proposition, particularly when contracts or policies aimed at long-term partnering might suggest inertia or "lock-in" in the buyer-supplier relationship. As discussed in the first paper of this series, sourcing strategies that involve multiple suppliers increase the probability that buyers' changing needs can be fulfilled, allow supplier competencies to be evaluated through benchmarking and yardstick competition, and provide a means of "testing" new suppliers (Liu et al. 2005). Collecting and disseminating comparable financial and nonfinancial performance information are central to the success of such benchmark practices.

Dekker's (2003) analysis of the collaborative use of supply chain cost information by a U.K. retail firm and a large group of its suppliers provides an example of the benefits of benchmark analyses for learning purposes. The study shows how one firm collected activity and cost data from suppliers and clustered suppliers into different networks to eliminate the most important differences between their operations that would inhibit comparisons. Suppliers' costs were subsequently compared with the average of their network, and comparisons were made across networks, regions, and store types to identify areas in which initiating projects for improvement would be worthwhile. By comparing suppliers' operations and practices, opportunities for improving operational performance emerged.<sup>3</sup>

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<sup>3</sup> To avoid obvious concerns of suppliers about opportunistic use of their cost data and reduced interest for participation, the retailer in this study did not use the cost data to directly compare the performance of individual suppliers in the same network.

More formal approaches to improvement are also facilitated by good performance measurement systems. In the first paper in this series (Anderson and Dekker 2009), we discuss the role of suppliers in joint product and process design. Approaches to structural cost management that we highlight—such as target costing and value engineering for disciplined cost reduction in product design, *kaizen* (continuous improvement) costing for disciplined improvement of processes, the application of learning curves for disciplined reduction of product costs after production launch, and open-book accounting to provide transparent assessment of cost-reduction opportunities across the value chain—all depend critically on reliable performance data. Indeed, although the focus on many of these techniques is financial performance (i.e., cost), all of these techniques for improvement weigh carefully any tradeoffs that would compromise quality, reliability, or productivity—as represented by nonfinancial measures of performance.

Performance measures and cost data are important for assessing how well the buyer-supplier collaboration is executed and for diagnosing opportunities for improvement. Yet consulting reports have found that this is an underdeveloped area for many firms (Aberdeen Group 2005), and that immature measurement systems pose a significant risk to supply chains (O’Keefe 2004). Research has begun to document how firms use cost and performance data in supply relations; however, significant questions remain. In particular, with the exception of a few case studies, we have limited understanding of how firms manage the feedback between evaluating transactions and day-to-day interactions with suppliers and the structural cost management decisions of sourcing, supplier selection, and product and process design. Within the firm, performance feedback is often facilitated through formal budgeting and planning processes. It would be useful to identify comparable processes in buyer-supplier relationships and to investigate whether these processes are subject to many of the hazards that accompany budgeting processes (e.g., slack-building, ratcheting). For researchers with expertise in information systems, a host of questions also exist related to system compatibility and integration, management for structured access (i.e., protecting supplier and buyer data and proprietary intellectual capital), and the influence of system design on decision making in light of economic motives and cognitive biases or limits of the decision makers. Indeed, a recent survey of supply chain executives identifies integration of information technology as one of the chief challenges of managing a globally dispersed supply chain (McKinsey & Company 2008). In sum, researchers have only begun to document performance measure use in supply chain management, and we should continue to investigate whether theory from a variety of disciplines that was developed in the context of the single firm will apply or will require adaptation to fit the supply chain management setting.

### EXECUTIONAL COST MANAGEMENT IN SUPPLY CHAINS: ASSESSING THE SUSTAINABILITY OF SUPPLY CHAINS

The executional cost management activities of measuring, evaluating, and improving supply transaction performance are essential to effective implementation of supply chain strategy. However, at times, even an effectively implemented strategy will fail to meet the competitive demands of the marketplace. This may reflect failings of strategy, or it may simply reflect changed circumstances from those that were anticipated at the time the strategy was crafted. As uncertainties in complex collaborations are resolved or as external circumstances change, earlier structural cost management decisions may prove incorrect or unsuited to present realities. Consistent with the “high-powered incentives” that markets impart through the profit motive (Williamson 1985), inappropriate supply strategies can become apparent relatively quickly in the interfirm setting as compared with an intra-firm setting (i.e., transactions between divisions of the firm). In particular, inappropriate supply strategies typically jeopardize profits of at least one supply partner, creating misaligned incentives and destabilizing collaboration. Even if contractual agreements exist that

compel continued transactions for some period, incentive misalignment often produces undesirable outcomes that fall outside the bounds of contracts or are difficult to detect. Consequently, when supply chain activities are indeed strategic, firms often go beyond monitoring supply transactions to evaluate supplier health as well as the sustainability of collaborations.

### **Evaluating Supplier Health**

Supplier health is a broader concept that transcends transactions with the buying firm to consider how the supplier is doing in other parts of its business, including sales to the buyer's key competitors. With the advent of Sarbanes-Oxley legislation (especially Section 404), public firms are made responsible for monitoring and reporting material risks to their own well-being that are associated with third-party transactions. Consequently, in addition to being an issue for management control of supply chains, evaluating supplier health is an issue for financial reporting and compliance (Protiviti, 2003). In current deliberations about the future of the U.S. automobile industry, Ford Motor Company and various international automobile makers have expressed concern that the failure of General Motors Corporation or Chrysler Corporation would precipitate supplier failures that would jeopardize even their relatively healthy operations.

Although financial data may be obtained from public or private sources, firms are also using audit approaches (e.g., SAS No. 70 statements, right-to-audit clauses) to ensure that they have adequate data to inform their assessment of supplier health (Anderson et al. 2006). As firms adopt and adapt to new compliance requirements, an interesting research question is whether enhanced measurement is associated with fewer risk realizations or better supplier performance (in the transactional sense) and what costs are associated with compliance. The costs and benefits of SOX regulation have been heatedly debated and are the subject of emerging research; however, the issues are somewhat different in the context of supply chain management, where costs and benefits are shared by two or more firms. In sum, assessing supplier health and understanding how firms combine these assessments with measures of transaction and relationship performance to reach an overall assessment of supplier and supply chain risk is an area that demands further attention by researchers.

### **Supplier Performance Evaluation versus Transaction Performance Evaluation**

Performance measurement practices described earlier, particularly those that employ competitive benchmarking and comparisons with external performance standards, may indicate that supply chain strategies and structural cost management decisions are flawed or outdated. However, transaction-level performance of the buyer-supplier dyad is often a lagging indicator of more fundamental problems in the supply relationship. As a result, many firms employ executive-level supply chain oversight to evaluate the health of the supplier and the supply relationship. In a recent survey (McKinsey & Company 2008), when asked about the most significant changes to supply chain management in the last five years, 56 percent of respondents identified a trend toward centralization of supply chain decisions. This is consistent with an earlier survey in which managers identified elevation of supply chain management to a strategic, enterprise-wide function of the firm as essential to managing supply chain risk (O'Keefe 2004).

One motivation for centralizing supply chain management is the opportunity to obtain economies of scale through coordinated purchases. However, as illustrated by Sun Microsystems (Farlow et al. 1996), a more significant factor is the need to develop strategic relationships with critical suppliers and to have firm-level oversight of transactions that may be dispersed across several buyer locations. Transaction-level performance measurement and control systems provide inputs to these supplier-level measurement and control systems. As Figure 1 illustrates, failures that are detected by the supplier-level systems are likely to require revisions of strategy and structural cost management decisions that were described in the first part of this series.

In addition to aggregating the transaction-level performance data of a given supplier (e.g., Farlow et al. 1996), supplier-level systems incorporate data on supplier health that can be important to evaluating and perpetuating sustainable collaboration. For example, Mouritsen and Thrane (2006) find that in three networks where firms collaborate on projects, accounting controls create “durability and predictability” in the relationship while providing structure and segmentation of duties that enhance efficiency of transactions. They conclude that accounting mediates, shapes, and constructs relations among the transacting partners through self-regulating and orchestration mechanisms that allow partners to identify and exploit complementarities among their respective resources and capabilities. Self-regulating mechanisms are unobtrusive and invisible to those who interact at the transaction level but central to those who manage at the supplier level, whereas orchestration mechanisms structure regular interactions.

In evaluating whether a particular supply chain configuration is sustainable, a key factor is the financial returns that partners obtain from collaboration. Firms will engage in collaboration only when they have the prospect of receiving a fair share of the risk-adjusted returns to collaboration (Seal et al. 1999; Tomkins 2001).<sup>4</sup> A “fair share” does not necessarily mean an equal division of collaborative benefits, but a share that is in proportion to each partner’s contribution and risk exposure. Accordingly, measurement processes need to be in place for evaluating partners’ contributions in comparison with extant agreements for sharing the profits (or cost savings) that come from increasing overall supply chain performance (Schmitz and Platts 2004). To stimulate long-term cooperation and knowledge sharing, Toyota, for instance, allows suppliers to appropriate 100 percent of the realized efficiency savings in the short term, with expectations for sharing this in the longer term (e.g., through price cuts; Dyer and Nobeoka 2000).

Often, however, firms do not have specific agreements or sharing rules in place, for instance because circumstances vary across projects, and individual solutions must be developed (Kajuter and Kulmala 2005). An example of a process of continually evaluating partner contributions and returns is found in Dekker’s (2003) study of supply chain management in a retail setting, where the collaborating firms faced concerns about how costs, benefits, and investments of supply chain improvement projects were to be shared. Historically, initiatives for improving the supply chain would result in an asymmetrical apportionment of costs and benefits, with the retailer often reaping most benefits and the supplier more costs and investments. Under the modified approach that is documented, the project is treated as an investment (with a minimum acceptable rate of return for the full value chain) and the partners negotiate the sharing rules. Outcomes of the negotiation could include price adjustments (e.g., upward when supply chain benefits would generate increased supplier costs) and agreements by the retailer to share in investments in the supplier’s processes.

Another example of formal cost and benefit-sharing practices is Dekker’s (2004) case study of the railway industry, where a buyer and supplier developed a financial incentive system to accrue and allocate the benefits of supply chain collaboration, and to induce long-term collaboration. By realizing successful joint innovations in the supply chain over time, funds are accrued and used to finance new joint innovation projects (supporting collaboration). If a threshold of funds is exceeded, the surplus is allocated among the parties (providing a prospect of returns to induce collaborative effort). Important to the success of such mechanisms is the availability of accurate cost and performance information for determining the costs and benefits of improvement projects.

Although TCO and value chain analysis present means of measuring performance, Dekker (2003) documents the broader context in which value chain analysis facilitates discussions be-

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<sup>4</sup> The issue of cost and benefit sharing relates closely to the design of the buyer-supplier relationship and use of incentives, as developed in Part 1 of this series (Anderson and Dekker 2009).

tween a retail firm and its suppliers. By decomposing the value chain into its constituent elements and identifying direct and indirect activities between the firms that create important interdependencies, the retail firm and its suppliers are able to jointly optimize activities and coordinate interdependent activities in the value chain. In this study the analysis is akin to activity-based costs—a new calculus for providing a more complete picture of the total costs of supplier-buyer transactions. However, it also demonstrates that for the firm studied, the value of the calculations lies not only in the calculated value, but even more so in the feedback and structural cost management opportunities that follow when suppliers and the buyer use the cost data to stimulate discussions about optimizing the value chain.

Owens and Minor, a large hospital supply firm, is another example of a firm that uses the data from TCO analysis to stimulate value chain improvements (Narayanan and Brem 2002). The firm takes the perspective of its own customers and computes the TCO of its own products as compared with competitors' products. This requires hospitals to share information from their cost accounting systems; however, in exchange Owens and Minor sales representatives help purchasing specialists see the "hidden" costs of poor supplier performance. Equally important, when hospitals share their costs of managing inventory, Owens and Minor identifies opportunities for restructuring the boundaries between itself and hospitals, taking over work for which it is better suited including kitting surgical supplies and JIT inventory replenishment.

Together these examples point to an emerging body of work on how accounting and control systems contribute to assessments of supplier health and evaluations of the sustainability of the supply chain configuration that was established through structural cost management decisions. However, as these examples indicate, the research in this area is still somewhat sparse and best characterized as field-based research and rich case descriptions. The peculiarities of particular supply chain configurations may make large-sample (e.g., survey research or multiple case studies) research impractical; however, it may be possible to test theory about buyer-supplier interactions in the context of a single buying firm and many supplying firms, as in Anderson et al. (2000), or to develop longitudinal databases for a buyer and several of its suppliers. With such data, interesting questions about the linkage between performance realizations and changes to profit-sharing rules could be investigated.

## CONCLUSION

Structural and executional cost management have always been central to profitable firms. Increasingly, firms are applying principles of strategic cost management to the supply chain as an important avenue for profit growth. Structural cost management opportunities are evident in partner selection processes, in the way that governance and control systems are designed to align partner interests, and in processes that facilitate joint design of innovative and effective products and processes. Executional cost management opportunities are evident in the performance measurement and management processes that are used to evaluate and improve transaction-level performance, relationship-level performance, and performance of the network of suppliers and customers that compose the full value chain.

Unfortunately, cost management skills are in short supply. Attention to executional cost management in manufacturing continues to be disproportionate as compared with structural cost management and cost management in service industries (Bromwich and Bhimani 1989), and many advances in structural cost management have been provided by researchers in fields other than accounting (Anderson 2007). The effects of this neglect are evident in a recent McKinsey & Company study:

[Competitive] pressures mean that many businesses desperately need a new approach to managing costs—one that reduces them over the long term ... The process of lowering overhead [support]

costs sustainably is deeper and more subtle than most companies realize. The tactical margin improvements that might be enough to meet a one-off quarterly earnings gap or to compensate for a delayed product launch will not bring about deeply embedded change, while more broadly ambitious cost reduction programs often lose their impetus after the initial effort. Companies that truly transform their approach to overhead costs, by contrast, design sustainability into the heart of their programs, aligning their costs with their strategies and maintaining a strong commitment to the effort. (Nimocks et al. 2005, 107–108)

Although accounting researchers have been aware for some time of new organizational forms that span firm boundaries (Otley 1994; Hopwood 1996; Kinney 2001), research on how these changes are affecting strategic cost management is relatively recent. The two-part series, of which this paper is the second part, reviews studies that examine strategic cost management in the supply chain, using selected papers in the accounting, operations, and strategy literatures. The first paper (Anderson and Dekker 2009) was organized around structural cost management in supply chains: (1) the structural cost management opportunities afforded by sourcing, selecting suppliers, and designing the supply relationship, and (2) the structural cost management opportunities associated with joint product and process design. This paper has taken up the executional cost management activities of measuring, monitoring, and continually improving performance of the supply chain. In both parts of the series we synthesize extant research and emergent practices and identify outstanding questions that suggest directions for future research.

As the earlier quote makes clear, strategic cost management skills are in high demand. For management accounting educators this is both a threat and an opportunity. Although traditional tools of executional cost management remain important, in an economy that is the midst of radical restructuring, structural cost management is the “growth market,” and structural cost management is rarely about mastering a set of tools. Indeed, Mintzberg (2004, 39) argues quite emphatically that we have overemphasized tools at the expense of a richer understanding of business context: “Technique applied with nuance by people immersed in a situation can be very powerful. But technique taught generically, out of context encourages that ‘rule of the tool’: Give a little boy a hammer and everything looks like a nail.”

Structural cost management is relevant for both accounting majors and general business students. With structural cost management skills and the broader framework of the value chain, accountants are more likely to earn a place at the top management table where strategy is developed. And unlike traditional cost accounting, much of which has been displaced by technology, structural cost management requires analysis that is neither routine nor repetitive, depending as it does on quantitative and qualitative data from internal and external sources. Of course, features that make structural cost management skills the purview of “knowledge workers” also make it challenging (but also, rewarding) to teach. In sum, although our review indicates promising developments in accounting research on both structural and executional cost management in supply chains, we believe that accounting education must make comparable strides in augmenting executional cost management training with teaching aimed at building structural cost management skills. The broader mandate of strategic cost management applied to the full value chain enlarges the domain of management accounting research and education.

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