

**The Use of Activity-based Costing with Competitive Strategies:
Impact on Firm Performance**

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Data Availability: *The data used in this study belong to the IMA and can only be used with permission.*

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Abstract

In spite of the many research studies regarding activity-based costing and management (ABCM), very few studies have examined its use in firms with differentiated competitive strategies. This study investigates the relationships between the use of ABCM, competitive strategy, and organizational performance. Based on a survey of U.S. firms, this study uses a method inspired by Lillis and van Veen-Dirks (2008) to divide firms into strategy groups based on their degree of emphasis on three strategic priorities (low price, flexibility, and customer service). We find some evidence of a direct impact on firm performance by the use of ABCM for firms with customer-service and low-price strategies. There is also strong evidence of an indirect impact of ABCM on firm performance for each of the three strategy types when used with certain other management control practices. This study supports contingency theory and helps meet Chenhall's (2003) call for research linking management control system practices and firm strategy with organizational outcomes.

Keywords: Activity-based costing, competitive strategy, organizational performance, and survey.

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INTRODUCTION

In the late 1980s and early 1990s, activity-based costing was hailed as a more accurate costing methodology that provided decision makers with the more granular cost data needed to make appropriate strategic decisions (Cooper and Kaplan 1988; Cooper et al. 1992; Drucker 1995). A new term “Activity-based Management” was coined to mean the use of activity-based costing to improve a business (Turney 1992).¹ There have been many studies of activity-based costing/management (ABCM) since then, but the prior literature relating to the impact of ABCM on firm performance is mixed at best (Kennedy and Afflack-Graves 2001; Cagwin and Bouwman 2002; Ittner et al. 2002; Banker et al. 2008). There have also been very few studies examining the use of ABCM with differentiated competitive strategies (Bhimani et al. 2005).

One study that attempts to link groups of firms with similar strategic emphases, management techniques, and management accounting practices, including ABCM, is an innovative study by Chenhall and Langfield-Smith (1998) [CLS]. Using cluster analysis, CLS found that firms emphasizing differentiation strategies and using most of the management techniques and accounting practices had the highest performance. ABCM usage was relatively low overall, but it was significantly stronger for higher-performing clusters than for low-performing clusters. However, as an exploratory study, the CLS study had some limitations in its methodology that make the results somewhat difficult to interpret. By including strategic priorities, management techniques, and management accounting practices in the same cluster analysis, the resulting clusters had mixed strategic priorities. For instance, ABC benefits are highest for the highest performing cluster. But because this highest

performing cluster is a mix of the “customer service” and “flexibility” strategic priorities plus all the management techniques and other accounting practices, it is unclear whether ABCM is beneficial for firms with a customer service priority or a flexibility priority. Also, there was only one “low price” cluster, which makes it difficult to compare the use of ABCM with another lower-performing “low price” cluster to determine if ABCM has an impact on firm performance.

This paper extends CLS by testing whether the use of ABCM with certain strategic priorities leads to improved firm performance. Based on a survey of U.S. firms, we use factor analysis based on strategic priorities to define three dimensions of strategy: customer service, flexibility, and low price. Next, using a method inspired by Lillis and van Veen-Dirks (2008), we dichotomize each of the three factor scores to identify firms with high emphasis or low emphasis on each of the strategies. This identification allows us to classify firms into relatively homogeneous strategy groups. We then examine empirically whether firm performance is affected by the use of ABCM within certain strategic priorities and with other management techniques and accounting practices including strong information system quality, budgeting, and profitability analysis practices.

This study contributes to the literature in several ways. This study is the first to link ABCM to firm performance for differentiated strategic priority groups. When ABCM is tested as a main effect on firm performance, it has no impact. But when use of ABCM is matched with customer service or low price strategies, we find evidence of a direct impact on firm performance. We also find strong evidence of an indirect impact of ABCM on firm performance for each of the three strategy types when used with certain other management

control practices. This study helps meet Chenhall's (2003) call for research linking management control system practices, firm strategy, and organizational outcomes.

The paper is organized as follows. First, we connect this study to the relevant prior literature and develop hypotheses relating the use of ABCM with different strategic priorities and with certain management techniques and accounting practices. Next, we describe the study's methodology, present the results, and relate the results back to prior studies. Finally, we conclude with a summary of the study's contributions and limitations.

RELEVANT PRIOR LITERATURE AND HYPOTHESES

Contingency theory suggests that all components of an organization must fit well with each other if an organization is to perform optimally (Perrow 1967). Chenhall (2003) reviews the literature from contingency-based research and suggests directions for the future. The "conventional, functionalist contingency-based approach" to research assumes that management control systems are implemented to achieve some desired organizational goals. Optimal performance occurs when context, structure, and business practices are congruent. Thus, high-performers tend to have a good fit and low performers tend to have a poorer fit. Chenhall (2003) suggests that one of the most important recent additions to this literature is the role of strategy. Other important factors cited included the role of contemporary management practices (e.g., ABCM). He calls for research on the links between different types of controls for operational, managerial, and strategic decisions and the relationship with organizational performance.

Strategic Priorities

Prior literature has characterized competitive strategies in different ways. Miles and Snow identified four general strategy types representing the intensity of product/market

development: prospectors, analyzers, defenders, and reactors.² Porter (1980, 1985) also identified three generic groups: differentiation, cost leadership, and focus (e.g., on a specific market segment).³ Treacy and Wiersema (1995) disaggregate differentiation and classify competitive strategies as product leadership, customer intimacy, and operational excellence (similar to the cost leadership category). Chenhall and Langfield-Smith (1998) find three generic strategy facets conceptually similar to Treacy and Wiersema: flexibility, customer service, and low price.

Firms with a flexibility strategy, which resembles Treacy and Wiersema's (1995) "product leadership" strategy, strive to differentiate their products or services through continual innovation and flexibility. The operating model should focus on invention of unique features or services, fast design changes and product development, and the ability to make rapid changes in volume or product mix.

Firms with a customer service strategy, ("customer intimacy" strategy in Treacy and Wiersema's framework), differentiate themselves by trying to deliver what individual customers want. They cultivate relationships with customers by trying to meet (and exceed) their expectations rather than necessarily trying to provide the latest product or lowest price. The operating model should focus on satisfying customer needs with high quality products and services, reliable delivery, effective post-sales support, and customized design features.

As suggested by Chenhall and Langfield-Smith (1998), successful "low-price" companies focus on ensuring processes are highly cost efficient so that they can provide their products or services at a cost relatively lower than their competitors (also Porter 1980, 1996; Treacy & Wiersema 1995). They tend to invest heavily in modern and efficient facilities, pursue cost reductions through product design and standardized offerings, and avoid

marginal customer accounts. Their management systems need to keep the organization running smoothly and efficiently. The culture abhors waste and rewards efficiency.

Following a single strategy is difficult because organizations in most industries today need to be both low cost producers and provide customers with high quality, timely and reliable delivery (Chenhall 2003). Porter (1980) describes firms that pursue a mixed (i.e., joint) strategy as “stuck in the middle” destined to have lower performance than those with a distinct (i.e., archetypal) strategy. A more recent view in the strategic management and manufacturing management literatures is that the most successful firms are those that balance multiple strategies (Chenhall 2003; Lillis and van Veen-Dirks 2008). As discussed earlier, most of the clusters in the CLS (1998) study had mixed strategic priorities including the top-performing cluster. Lillis and van Veen-Dirks (2008) provide an excellent discussion of joint versus archetypal strategies and provide one of the few empirical studies of management control system practices of firms with joint strategies.

ABCM and firm performance

Prior research testing for associations between use of ABCM and firm performance has been mixed at best (Gordon and Silvester 1999; Ittner and Larcker 2001; Kennedy and Afflack-Graves 2001; Cagwin and Bouwman 2002; Ittner et al. 2002; Banker et al. 2008). Kennedy and Afflack-Graves (2001) provide the only evidence to date that ABCM has a direct benefit on firm performance. They found significant superior stock returns for firms adopting ABCM over non-adopting firms, although there was a 2-3 year delay between implementation and the stock price benefits. They also found that the ABCM firms had higher operating profit and return on equity than the non-adopting firms. However, they add that, “While ABCM may provide a richer information base that leads to new management

insights, it is ultimately management that is responsible for taking new actions that lead to value enhancement” (39).

Those studies that do find a connection between ABCM and firm performance usually find these benefits are contingent upon its use with other initiatives or in certain settings. Cagwin and Bouwman (2002) find a positive association between ABCM and ROI when ABCM is used with other strategic initiatives in complex and diverse firms, where costs are relatively important, and where there are a limited number of intra-company transactions. Ittner et al. (2002) find that extensive ABC use has no direct impact on ROA or manufacturing cost, but there is evidence that it has a positive indirect effect on manufacturing cost through a plant’s quality level and improvements in cycle time. Ittner et al. (2002) also find evidence that firms using ABC extensively have larger information technology expenditures than non-ABC users and higher adoption of advanced manufacturing practices (e.g., just-in-time, total quality management, employee empowerment, customer and supplier partnerships).

Banker et al. (2008) find that ABC does not have a direct impact on plant performance measures, but rather the impact on performance is mediated through implementation of world-class manufacturing practices (e.g., JIT, TQM, benchmarking, etc.). They suggest that ABC is an enabler for the development of process-centric capabilities required to successfully implement these practices (Cooper and Kaplan 1991; Ittner and Larcker 1997; Fullerton and McWatters 2002; Anderson et al. 2002).

Linking ABCM and strategy

Although there has been limited research regarding the impact of ABCM on firm outcomes when used in conjunction with other initiatives, there has been very little research

examining its use in firms with different competitive strategies (Bhimani et al. 2005). Early studies found “linkage to competitive strategy” to be a common factor related to ABCM implementation success (Anderson 1995; Shields 1995; Foster and Swenson 1997; Krumwiede 1998; Anderson and Young 1999; England & Gerdin 2008). However, linkage to *specific* strategies was not considered. Gosselin (1997) hypothesized and found that business units with a prospector strategy (also characterized as flexible organizations) were more likely to adopt ABCM. Bhimani et al. (2005) finds limited evidence that defenders perceive the success of ABCM to be higher than prospectors and analyzers. However, the prior research on whether an innovative or prospector culture is associated with implementation of ABCM is mixed (Baird et al. 2004; Bhimani et al. 2005).

Several studies have found evidence that management accounting practices help satisfy the demands for information created by the different strategies and operations (Bisbe and Otley 2004; Cagwin and Bouwman 2002; Simons 1987; Govindarajan 1988). Simons (1987) found that prospectors adapted their cost management systems to user needs more than defenders.

Chenhall and Langfield-Smith (1998) found early evidence that various profiles of management techniques and management accounting practices can work together in a system with certain strategic priorities to enhance firm performance. Based on a survey of Australia’s largest companies, Chenhall and Langfield-Smith (1998) used cluster analysis to form groups of firms with similar strategic priorities, management techniques, and management accounting practices. Strategic priorities were based on three factor scores (customer service, low price, and flexibility). Management techniques included factor scores for six different practices (e.g., human resource management policies, integrating systems,

etc.). Management accounting practices were based on factor scores for six different practices, including benchmarking, activity-based costing, and strategic planning.

Organizational performance was measured using an instrument developed by Govindarajan (1988) and Govindarajan and Fisher (1990) in which respondents assess their business performance relative to competitors over the last three years across ten dimensions.

The resulting six-cluster solution showed considerable variation in strategic priorities and other practices. They found that firms emphasizing differentiation strategies and using most of the management techniques had the highest performance. ABCM usage was relatively low overall but its usage was found to be significantly stronger for higher-performing clusters than for low-performing clusters. In this study, we attempt to extend the results of Chenhall and Langfield-Smith (1998) by increasing and clarifying the strategy classifications and focusing on whether the use of ABCM with certain strategic priorities leads to improved firm performance.

ABCM & customer service strategies

Chenhall and Langfield-Smith (1998) hypothesized that ABCM would be used by higher-performing, low-price oriented firms. However, they found its use was actually highest among strong performing firms with a customer-service/flexibility strategic focus. One explanation is that ABCM can help customer service-oriented firms better understand the costs of meeting their customers' needs. If management uses the better activity cost information to take actions that help ensure their customer service efforts are appropriate and profitable, then the firm will have better performance outcomes. Firms with a customer service orientation may enhance performance with ABCM when used with customer profitability analysis, quality information systems, and the balanced scorecard.

Customer profitability analysis. ABCM may be especially beneficial to customer service-oriented firms when used in conjunction with customer profitability analysis (CPA). Kaplan and Cooper (1998) discuss the benefits of using ABCM with customer profitability analysis, including more profitable pricing structures aimed at turning unprofitable customers into profitable ones. They suggest other ways this combination can increase profitability including targeted negotiations with customers regarding price, product mix and variety, delivery terms, and distribution and payment arrangements. ABCM is often recommended as an effective way to measure customer related costs for CPA (Searcy 2004; Niraj et al. 2008; Van Veen-Dirks and Molenaar 2009). Van Veen-Dirks and Molenaar (2009) suggest the real opportunity for CPA is in transforming unprofitable customers into profitable ones through better pricing decisions and structures. They suggest ABCM helps companies gain insight into the profitability of customers. Textbooks also discuss how customer profitability analysis is facilitated with ABCM information (Horngren et al. 2009; Blocher et al. 2010).

Quality information systems. Using ABCM with a quality information system that contains a wide array of real-time customer data coming from integrated systems may be especially effective in isolating and measuring the costs of serving customers' needs, thus allowing firms to better identify profitable services and customers. Kallunki and Silvola (2008), Granlund and Malmi (2002), Kaplan and Cooper (1998) all support the idea that integrated enterprise resource planning (ERP) systems help firms implement advanced cost accounting practices such as ABCM more easily. Proposed benefits include greater and more frequent data exchanges between systems than "PC-based" systems, more accurate budgeting and resource planning, sensitivity analysis, and transfer pricing, and more potential cost driver data availability.

On the other hand, there is prior literature suggesting that ABCM is not necessarily implemented with ERP systems. Granlund and Malmi (2002) find that ERP implementation generally did not influence the decision to adopt ABCM or any other management accounting or MCS practices. It did allow for faster data processing in some cases, but generally not more advanced management accounting methods. Possible reasons include the time and resources needed to implement ERP and a perceived lower need for ABCM information after ERP implementation due to the ability to get more cost information that can be disaggregated to very low levels. The Granlund and Malmi (2002) study did find evidence that half the ERP companies studied handled product/customer-level cost and profitability analysis in the ERP environment. Hyvönen (2007) finds that a fit between customer strategy, financial performance measures, and ERP system implementation has a positive association with firm performance. This suggests that the work necessary to implement integrated systems helps provide the data necessary to be successful with a customer-focused strategy.

For ABCM to be successful with a customer service strategy, it may take more than just an integrated information system. It may require other strong characteristics such as user friendliness so the data is available, a wide array of cost and customer data, and real-time availability. Having such strong customer-related data in conjunction with an ABCM model that effectively identifies appropriate cost drivers and activity rates could greatly enhance these firms' ability to assess the costs of meeting customer needs, take appropriate actions, and thus enhance firm performance. Of course, the availability of good ABCM information alone will not make a company successful. Taking appropriate actions with that information is what will make it successful. Actions might include identifying customers that are profitable and those that are not so they can enhance their services to the profitable customers

to lower attrition and increase their purchases. For the unprofitable customers, they might charge extra fees or reduce services to turn them into profitable customers or lose them as customers; either way firm profitability is increased (Morton 2002).

Balanced Scorecard. Finally, CLS proposed that high-performing differentiation firms gain benefits from using a balanced scorecard (BSC) approach to strategic performance management. However, they found that usage of BSC was similar for both high- and low-performing differentiation firms. In this study, we propose that usage of BSC and ABCM together will help customer service-oriented firms identify and measure better performance metrics for servicing customers for their scorecard (Kaplan and Norton 1996, 2001). Further, this will enable these firms to benchmark their customer service activity costs against other firms or the industry to identify and reduce unnecessary service costs.

Based on the preceding discussion, the following hypotheses will be tested:

H1: Firms with a high commitment to a customer-service strategy will have higher performance with stronger usage of ABCM than those with weaker usage, especially firms that use of the following practices:

- *Customer profitability analysis (H1a)*
- *Quality information systems (H1b)*
- *Balanced Scorecard (H1c)*

ABCM & Low-price strategies

Management accounting practices for cost leadership firms should help identify areas of waste and track cost reduction efforts. To do this, they should identify specific activities and related drivers that can be used to drive down costs (Porter 1985, 1996). Although Chenhall and Langfield-Smith (1998) hypothesized ABCM would be used by higher-performing, low-price oriented firms. The highest-performing low-price cluster did show stronger benefits from various practices including ABCM. However, as discussed earlier, it is

hard to make conclusions from the Chenhall and Langfield-Smith (1998) study because the clusters had mixed strategic priorities.

In this study, we test whether firms with differentiated low-price strategic priorities and relatively strong usage of ABCM have higher performance than low-price firms with low usage of ABCM. On the cost side, ABCM should be helpful for simplifying processes, eliminating nonvalue-added costs, and then monitoring cost reduction efforts to achieve low costs. This in turn should allow these firms to be able to charge the targeted low price for products and services. Firms with a low-price strategy may need to use ABCM with other practices to gain performance benefits. In the CLS study, the highest-performing low-price cluster also reported much stronger benefits from the following practices: quality information systems, manufacturing systems innovations, improving existing processes, benchmarking, ABCM, and strategic planning.

Quality information systems. Low-price firms will typically have strong integrated systems to help provide the detailed information needed for process improvement (CLS 1998). For ABCM to be effective for these firms, it may require a highly accessible, wide array of real-time process data coming from integrated systems to identify and make process improvements.

Strong budgeting practices. CLS proposed that low-price firms would benefit from strong budgeting practices (referred to as “traditional accounting techniques”) but found that they did not differentiate high and low performers in this strategy group. Strong budgeting practices used in conjunction with ABCM may help these low-price firms allocate their scarce resources more prudently. Kaplan and Cooper (1998, 302) state, “Activity-based budgeting gives organizations the opportunity to authorize and control the resources they

supply based on the anticipated demands for the activities performed by the resources.” Prior research has found that budgeting is a common reason for using ABCM and that information is more likely to be used for decision making when it is part of the budgeting system (Krumwiede 1998b). Perhaps this combination will also lead to higher firm performance with a low-price strategy through better resource management.

Profitability analysis. To motivate cost reduction at low price-oriented firms, the performance measurement and control systems will emphasize profitability analysis (CLS), which includes customer and product profitability analysis. Profitability analysis should improve with the better cost drivers and rates provided with ABCM. This combination may in turn improve product line, customer, process, and other business decisions.

Implementing new processes. As stated earlier, low-price strategy firms will focus on ensuring production processes are highly cost efficient. To do this, they will look for ways to improve existing processes through downsizing, reengineering, or trying new process or manufacturing methods. Using ABCM to identify areas of waste, implement new processes, and then monitor cost reduction efforts using ABCM may be an effective combination for driving down costs.

Based on the preceding analysis, the following hypotheses will be tested:

H2: Firms with a high commitment to a low-price strategy will have higher performance with stronger usage of ABCM than those with weaker usage, especially firms that use the following practices:

- *Quality information systems (H2a)*
- *Strong budgeting practices (H2b)*
- *Profitability analysis (H2c)*
- *Implementing new processes (H2d)*

ABCM & flexibility strategies

Flexible companies need to be able to adapt to changing product and demand characteristics. Management accounting systems can help firms be more flexible by providing better understanding of inter-relationships between manufacturing processes, demand uncertainty, and product complexity. This understanding allows plant managers to direct relevant process improvements which facilitate implementing flexible practices such as JIT (Fullerton and McWatters 2002). Practices such as JIT and use of teams allow firms to make changes quickly and can support a flexibility strategy (Monden 1993). Banker et al. (2008) suggest that ABC is an enabler for the development of process-centric capabilities required to successfully implement world-class manufacturing practices like JIT, TQM, and competitive benchmarking (Ittner and Larcker 1997; Anderson et al. 2002; Cooper and Kaplan 1991).

One factor that Banker et al. (2008) do not include in their study is strategic focus. Contingency theory suggests that a match between strategy and appropriate management control system practices will lead to optimal performance outcomes. Perhaps firms following a flexibility strategy and using ABCM to facilitate the implementation of flexible practices will achieve better performance than those not using ABCM.

On the other hand, the prior research is mixed regarding whether an innovative or prospector culture is associated with implementation of ABCM (Baird et al. 2004; Bhimani et al. 2005), suggesting that ABCM may no longer be considered an innovative costing approach. Also, the results of the Banker study suggest that ABCM is only beneficial for firms who implement other flexible operational practices such as JIT and TQM. Hence,

ABCM may not provide a direct benefit to firms with a flexibility strategic focus. This study will also test whether ABCM has an impact on performance for flexibility firms when these other practices are used.

Flexible manufacturing practices (JIT and teams). Practices such as JIT and use of teams allow firms to make changes quickly and can support a flexibility strategy (Monden 1993). Prior research also suggests that ABCM supports world-class manufacturing by providing a better understanding of the underlying processes and helping to make process improvements to help these firms be more profitable (Banker et al. 2008; Fullerton and McWatters 2002; Cooper and Kaplan 1991). These process improvements enable JIT and lean operation goals to be achieved and team structures to operate more smoothly. When these firms also follow a flexibility strategy, they are better able to respond to changes in demand, products, or services. Thus, it may be that ABCM will be most beneficial to flexible-oriented firms when they also use world-class manufacturing practices such as JIT and team structures.

Product profitability analysis. In addition, these firms often must assess the profitability of new products quickly. ABCM may be especially useful here when used with strong profitability analysis to get more accurate analysis. On the other hand, it is possible that constantly changing organizational structures and product lines may make it more difficult to implement ABCM.

Based on the preceding discussion, the following hypotheses are tested:

H3: Firms with a high commitment to a flexibility strategy will have higher performance with stronger usage of ABCM than those with weaker usage, especially firms that use of the following practices:

- *Just-in-time (JIT) practices (H3a)*
- *Team structures (H3b)*
- *Product profitability analysis (H3c)*

RESEARCH METHOD

Working with the Institute of Management Accountants (IMA), we mailed a survey to approximately 1,100 members of the IMA's Cost Management Member Interest Group. We used several techniques to maximize response rate (Dillman 2000; Young 1996).⁴ Respondents could either respond to the hardcopy survey or to an online version available on the IMA website. A total of 307 surveys out of 1,100 members were received (61 online and 246 hardcopy). We excluded 43 surveys because of incomplete responses, leaving a total of 264 usable responses (24% of the original target population) for data analysis. In addition, several respondents did not answer all of the practice or performance questions, lowering the number of usable responses for certain tests. Nonresponse bias is always a concern with a survey methodology (Young 1996). Yet we did not find evidence of non-response bias.⁵ Respondents included Controllers (29.3%), CFOs (22.1%), Accounting Managers/Supervisors (25.2%), Accountants/Analysts (15%), and nonaccounting managers (8.0%).

Competitive Strategy

Chenhall and Langfield-Smith (1998) used a single cluster analysis based on strategy, management techniques, and management accounting practices. However, the resulting clusters are somewhat difficult to interpret because they tend to mix strategic priorities. Various methods have been used to classify firms into strategy categories and no one "best" way has emerged (Campbell-Hunt 2000; Ketchen & Shook 1996). In this study, we use a method similar to that used by Lillis and van Veen-Dirks (2008) based only on strategic priorities to get more "pure" strategy groups. We started with the questions used by Chenhall

and Langfield-Smith (1998) to assess competitive strategy and modified two of the questions to include “or services” for nonmanufacturing firms (see questions in Appendix). Also, because some respondents did not answer all the strategic questions, we followed Ittner and Larcker (1995, 1997) and Little (1992) and used a conditional mean imputation for missing strategy data for 26 respondents using stepwise ordinary least squares. Thirty-three respondents had more than one missing value for at least one competitive strategy category and had to be dropped from further analysis, resulting in the 264 usable responses for analysis involving firm strategy.

Next, we performed principal components factor analysis (with varimax rotation) on all the strategy questions (Ketchen & Shook 1996; Hyvönen 2007; Lillis and van Veen-Dirks 2008). The resulting three factors (see Table 1) represent orthogonally independent dimensions of strategy and represent the only dominant factors with eigenvalues over 1.0. The factors have acceptable Cronbach alpha reliability scores ranging from .65 to .68 (Nunnally 1967) and explain 58% of total variance. These factors are also consistent with the customer-service, flexibility, and low price strategic typology discussed earlier.⁶

[Insert Table 1 about here]

Next, using the factor loadings to generate a composite score for each of the three strategic factor dimensions (mean of zero, standard deviation of one), we dichotomize each of the strategy variables at zero to identify firms with *high* values ($>$ zero) and *low* values (\leq zero). Table 2 provides a cross-tabulation of how firms are categorized based on their commitment to the three different strategic priorities: low price (LP), flexibility (FL), and customer service (CS). In all, there are 153 “high CS” firms, 136 “high FL” firms, and 128 “high LP” firms. Like Lillis and van Veen-Dirks (2008), we find a small percentage of firms

with a higher emphasis on low price and a lower emphasis on both flexibility and customer service (27 out of 264, or 10.2%, compared to 6% in the Lillis and van Veen-Dirks study). Based on additional analysis, the strategic classifications seem reasonably valid and reliable.⁷

[Insert Table 2 about here]

ABCM and other management practices

We used factor analysis to combine an original list of 46 questions regarding usage of ABCM and other management techniques and accounting practices into eight composite factor scores for each firm. These eight practices are not intended to be all-inclusive, just those needed to test the hypotheses. To create the list of practice questions, we started with the list used by CLS (1998) and modified it based on other literature suggesting how they have been linked to ABCM and to particular competitive strategies or to organizational performance (much of this literature was discussed earlier). Because of the large number of practice questions in the survey, 11 questions did not load sufficiently on a factor and were dropped from further analysis. A second factor analysis was used to compute the final factor scores. The resulting eight factors represent orthogonally independent practices and have acceptable Cronbach alpha reliability scores ranging from .71 to .89 (Nunnally, 1967) and explain 68% of total variance. The Appendix provides definitions and descriptive information for both raw and standardized response data.

Firm Performance

To compute firm performance, we take a similar approach as Chenhall and Langfield-Smith (1998) and use an instrument developed by Govindarajan (1988) and Govindarajan and Fisher (1990) (see Appendix for questions and descriptive data). Respondents were asked to assess their business unit's performance (from 1=significantly below average to

7=significantly above average relative to their industry) over the last three years based on a list of ten nonfinancial and financial metrics. Next, we asked each respondent to *rank* each metric according to its relative importance in his or her business. The respective performance and importance scores were multiplied, and a final performance score was computed for each firm by taking an average of all ten metrics (MEANPERF). In addition, we used factor analysis to reduce the ten different “performance x importance” metrics into three factors: profitability performance (PROFPERF), quality performance (QUALPERF), and sales performance (SALESPERF). The resulting three factors (see Table 3) represent orthogonally independent dimensions of performance and have acceptable Cronbach alpha reliability scores ranging from .66 to .83 (Nunnally 1967) and explain 66% of total variance.

[Insert Table 3 about here]

Control variables

Some firm characteristics need to be controlled for when investigating the use of ABCM. First, there may be unique benefits of using ABCM to manufacturing firms (Swenson 1995). In this study, manufacturing firms are designated with a dummy (0,1) variable (MFG). Overall, about 82% of the firms in the data set are manufacturing firms. Second, as an organization becomes larger, the need for managers to handle greater quantities of information increases to a point where they have to implement more controls (e.g., rules, documentation, specialized roles, greater decentralization, etc) (Chenhall 2003). Prior studies have generally found a relationship between firm size and adoption of ABCM (Innes and Mitchell 1995; Krumwiede 1998), but mixed results between size and implementation success of ABCM (Krumwiede 1998a; Cagwin & Bouwman 2002). Kallunki and Silvola (2008) suggest that it is life cycle phase rather than size that is

important. Even if ABCM is significantly more common among firms in the maturity and revival life cycle phases than firms in the growth phase, firms in the former stages still tend to be larger than firms in the growth stage. Size is measured in terms of number of employees (NOEMPL).⁸

Table 4 provides descriptive statistics (means) for the performance measures, control variables, ABCM, and other practices. The statistics are presented for all firms and for each of the strategy types. As shown, ABCM usage does not appear to vary significantly among the high commitment levels for each of the three strategy groups. However, firm performance, especially as measured by MEANPERF, QUALPERF, and SALESPERF, tends to be significantly higher for the “high” strategy groups. This result supports Porter’s (1980) assertion that firms pursuing a clearly defined strategy will outperform those with no clear strategy.

[Insert Table 4 about here]

RESULTS AND DISCUSSION

We tested our hypotheses by performing ANCOVA analyses and subsequent contrast analyses using the four measures of firm performance (PROFPERF, QUALPERF, SALESPERF, and MEANPERF) as the dependent variables. There were no statistically significant results for SALESPERF, suggesting that the use of ABCM is not related to increased sales revenues. Thus, the subsequent discussion will emphasize the other three measures of firm performance. The main effects of each strategy type and ABCM on the measures of firm performance are not reported in the tables. However, significant results are mentioned below. Also, although full ANCOVA results are reported in Tables 5-7 (Panel A), it is the specific contrast tests comparing the “high commitment” strategy groups that use

ABCM versus those that don't use ABCM that directly test the hypotheses H1-H3. Panel B for each table provides contrast analyses to test the hypotheses by comparing least squares mean performance scores for the specific cells of interest in each interaction.

Hypothesis 1

The binary equivalent of CUSTSERV (CS01) as a main effect is statistically significant in explaining QUALPERF, SALESPERF, and MEANPERF (all $p=.000$).⁹ The binary equivalent of ABCM (ABCM01) is marginally significant in explaining PROFPERF ($p=.099$) but not significant for the other measures of performance. As shown in Table 5 (Panel A), the interaction term *CS01 x ABCM01* is significant in explaining PROFPERF ($p=.031$) and marginally significant in explaining MEANPERF ($p=.092$), suggesting there are differences in profitability performance when ABCM is used with a customer service strategy.

[Insert Table 5 about here]

To test H1, we examine the impact of ABCM on the performance of firms focusing on a customer-service strategy. As shown in Table 5 (Panel B), contrast analysis shows that the “High-CUSTSERV/High-ABCM” has significantly higher PROFPERF ($p=.003$) and MEANPERF ($p=.027$) than the “High-CUSTSERV/Low-ABCM” group. Thus, H1 is supported for profitability and overall mean performance.

There is also evidence that high-customer service firms using ABCM with customer profitability analysis (CPA) have higher PROFPERF ($p=.051$), but not for other types of performance, so H1a is only partially supported. The strongest contributing practice for high-customer service firms using ABCM is a quality information system (ISQUAL). Both PROFPERF ($p=.017$) and MEANPERF ($p=.014$) were significantly higher when using this

combination, supporting H1b. The combined use of ABCM and balanced scorecard practices by high-customer service firms is generally not significant at acceptable levels in explaining firm performance, so H1c is not supported.

Hypothesis 2

As a main effect, the binary equivalent of LOWPRICE (LP01) is statistically significant in explaining QUALPERF ($p=.002$) and MEANPERF ($p=.000$). ABCM's binary variable is significant for PROFPERF ($p=.04$) but not for the other performance measures. BUDGET01 is significant only for MEANPERF ($p=.03$). PROFANAL01 is significant for QUALPERF ($p=.02$). ISQUAL and NEWPROC are not statistically significant as main effects for any of the performance measures.

Table 6 (Panel A) shows that the 3-way interaction of low-price strategy, ABCM, and ISQUAL is statistically significant for PROFPERF and QUALPERF. Contrast analysis (Panel B) shows that PROFPERF is statistically higher for low-price firms using ABCM ($p=.022$). Also, the 3-way interaction of low-price strategy, ABCM, and ISQUAL is statistically significant for PROFPERF ($p=.004$) but not for the other performance measures. Panel B also shows that both PROFPERF and MEANPERF are statistically higher when low-price firms use ABCM with strong budgeting practices. Thus, H2, H2a, and H2b are supported primarily for profitability performance. Firms focusing on low price appear to receive profitability benefits by using ABCM, especially when used with a quality information system and strong budgeting practices. There is no evidence that these firms receive any added benefit from profitability analysis or implementing new processes (H2c and H2d not supported).

[Insert Table 6 about here]

Hypothesis 3

Like CUSTSERV, the binary equivalent of FLEXIBLE (FL01) is statistically significant as a main effect in explaining QUALPERF, SALESPERF, and MEANPERF. ABCM is once again significant as a main effect only for PROFPERF. JIT and TEAMS are significant for QUALPERF and MEANPERF. Product profitability analysis is statistically significant for all but sales performance.

Table 7 (Panel A) suggests that firms focusing on a flexible strategy find that using ABCM receive a significant impact on quality performance and overall mean performance, especially when combined with flexible manufacturing practices. Contrast analysis (see Table 7, Panel B) suggests that flexible-strategy firms using a combination of ABCM and JIT have higher profitability, quality, and overall mean performance. And flexible firms using a combination of ABCM and teams have higher quality and overall mean performance. These findings support H3a and H3b. However, flexible firms using ABCM without JIT or teams do not show higher performance. Nor do these firms have higher performance when also using product profitability analysis. These findings do not support H3 or H3c.

[Insert Table 7 about here]

Additional analysis of low-strategy firms

In Panel B of Tables 5-7, we analyze the impact of ABCM usage for firms with a relatively high level of strategy emphasis (e.g., “High CUSTSERV” firms). We next performed the same analysis (not tabulated) for firms with relatively *low* level of strategy emphasis (e.g., “Low CUSTSERV” firms). For all strategy types, there is no statistically significant difference in performance between the high-ABCM and low-ABCM groups for

all measures of performance. In addition, we analyzed the impact of ABCM on performance for the 31 firms in the study with low levels of all three strategic factors (see Table 2, cell 2.4). Again, we find no statistically significant difference in performance between the high-ABCM and low-ABCM groups. This additional analysis suggests that ABCM is more beneficial for firms with a stronger strategic emphasis than for firms with a weaker strategic emphasis.

Discussion of Results

Table 8 summarizes the results from Tables 5-7 (Panel B). As shown, the strongest impact of ABCM appears to be for firms pursuing a customer service strategy. Profitability, quality, and overall firm performance appear to be improved when ABCM is used with a customer service strategy. Profitability may improve as ABCM helps these firms better measure and understand the costs of serving their customers and make better strategic decisions about what they will do and will not do for them (Kaplan and Cooper 1998; Searcy 2004; Niraj et al. 2008; Van Veen-Dirks and Molenaar 2009). For example, firms may be able to identify unprofitable segments and customers, appropriately charge customers for services rendered, and decline unprofitable customer requests (Searcy 2004). Quality performance, which includes internal process performance, customer satisfaction, and employee satisfaction, may be improved through using ABCM to eliminate nonvalue-added activities and improve processes. These actions help improve quality and the ability to meet delivery dates.

[Insert Table 8 about here]

Interestingly, although ABCM and customer profitability analysis show some main effects on performance, information system quality did not. When strong information system

quality is combined with a customer service strategy, high usage of ABCM showed significantly higher firm performance than for those firms not using ABCM. These results suggest that having the information available and accessible is not sufficient for higher firm performance, it is what they do with it that matters.

H2 proposed that firms emphasizing a low price strategy will have higher performance when they have stronger use of ABCM. Results suggest that these firms receive a performance benefit by using ABCM, especially with a quality information system or strong budgeting practices. This suggests that ABCM helps these firms identify high cost activities and focus on reducing the cost or the activity. We found that ISQUAL does not show a main effect on performance. But when ISQUAL is combined with a low price strategy, firms using ABCM have higher performance than those who do not. Strong budgeting practices along with ABCM (i.e., activity-based budgeting) suggests that resources are allocated and controlled more appropriately (Kaplan and Cooper 1998). Prior research has found evidence that ABCM is more likely to be used for decision making when it is also used as part of the budgeting process (Krumwiede 1998b). The results of this study also suggest this combination with a low-price strategy helps firms be more profitable.

The results of testing H3 suggest that firms implementing a flexibility strategy do benefit from ABCM, but only when used along with flexible manufacturing practices such as JIT and team structures. These firms strive to be able to provide unique products or services and make quick design or production changes. Perhaps ABCM helps these firms eliminate waste so they can be more flexible. It may also help provide some control to help these firms from being too flexible or too innovative in an unprofitable way. These firms are frequently developing new products and so have increased need for product profitability analysis.

Although product profitability analysis along with ABCM was not found to significantly increase performance, it may be that ABCM enables better product profitability analysis that leads to performance benefits when used along with flexible manufacturing practices.

These results add to Chenhall and Langfield-Smith's (1998) findings which suggested that the benefits of ABCM are highest for firms with a mixed customer-service/flexibility strategic focus. This study clarifies the strategy groups and suggests that ABCM contributes most directly to firms with a customer service or low-price strategic focus and not as much to those with a flexibility focus.

The results of this study suggest that ABCM is often a good fit for firms pursuing customer-service strategies, especially when used with quality information systems. Firms emphasizing a low price strategy have higher profitability performance with stronger use of ABCM, especially with strong information systems and budgeting practices. ABCM can help these firms identify high cost activities, improve process efficiency by eliminating nonvalue-added activities, and monitor cost reduction efforts. Thus, they are better able to meet their low-price targets and be competitive in their industries.

Firms following a flexibility strategy do not appear to benefit as much from ABCM, at least directly. These firms appear to benefit most from ABCM only when using it to help implement flexible management practices. There may be other business practices that affect the strategic benefits of ABCM as well. (Banker et al. 2008). Banker et al. (2008) suggest that ABCM is an "enabler" for these flexible manufacturing practices which mediate its impact on operational performance. These firms strive to be able to provide unique products or services and make quick design or production changes. Without the other flexible

operational practices (e.g., JIT), perhaps the dynamic flexible environment makes implementing ABCM difficult and it becomes an inhibitor instead of an enabler.

Contributions and limitations

Many firms today implement a variety of management tools, hoping each one will “add value.” This study contributes to the literature in several ways. This is the first study to link ABCM to firm performance for differentiated strategic groups. Various aspects of firm performance, especially profitability, are shown to be higher with the use of ABCM and a high commitment to customer service or low-price strategies. Firms with flexibility strategies do not appear to benefit from ABCM directly as much as with other strategies. Also, firms without a strong commitment to any strategy do not seem to benefit significantly from ABCM.

Prior studies tying the use of ABCM to firm performance have had conflicting results (Gordon and Silvester 1999; Ittner and Larcker 2001; Kennedy and Afflack-Graves 2001; Ittner et al. 2002; Cagwin and Bouwman 2002; Banker et al. 2008). The only other study to find a direct impact on outcomes is the Kennedy and Afflack-Graves (2001) study, which found significant superior stock returns for ABCM firms over non-adopting firms after a 2-3 year delay. It also found that the ABCM firms had higher operating profit and return on equity than the non-adopting firms. This study adds to these results by suggesting the profit impact of ABCM is greatest for firms emphasizing customer service and low price strategies. There is also strong evidence of an indirect impact of ABCM on firm performance for each of the three strategy types when used with certain other management control practices. This study supports contingency theory and helps meet Chenhall’s (2003) call for research linking management control system practices and firm strategy with organizational outcomes.

The results of this study should be considered in light of several possible limitations. First, categorizing firms into generic strategy groups is challenging and open to debate. Using three different factor scores to classify firms appears reasonable based on classifications in other studies, but each company's competitive strategy is unique. Second, the responses by manufacturing firms exceeded those by nonmanufacturing firms by a 4:1 ratio. Although we attempt to control for this issue with a dummy (0,1) variable in the analysis, the lower number of nonmanufacturing firms limited the analysis of this subset of firms. The impact of ABCM may be different for manufacturing than nonmanufacturing firms. There may also be more specific industry differences that we were unable to test with the cross-sectional data set. Third, there may be other management techniques and management accounting practices not considered for this study that complement the use of ABCM and may affect performance for individual firms. The fourth limitation is that because most of the responses are anonymous and come from various organizational levels, we are not able to validate performance ratings using superiors' ratings or publicly available financial data. Prior research has found evidence that subordinates' self-assessment tends to correlate with both objective assessments and with superiors' assessments (Chenhall 2003). Fifth, a potential explanation for the differences in the amount of variance explained in the different criterion variables is that the measures were all filled out by the same person, and thus may share common method variance (Cote and Buckley 1987; Podsakoff and Organ 1986). However, using instruments already established in the literature and the range of strategy and individual performance scales used made it more difficult to respond to the questions similarly (Lillis and van Veen-Dirks 2008). Finally, although the survey method and broad range of firms enhances the external validity and generalizability of the study, the

lack of variable manipulation means that “cause” cannot be inferred from the study (Young 1996; Birnberg, Shields, & Young 1990).

Not addressed in this study is whether firms pursuing a combined differentiation-low price strategy will have a higher performance impact from using ABCM than will the groups pursuing an single strategy. It may be that that ABCM helps curb “excessive differentiation” for these joint strategy firms (Lillis and van Veen-Dirks 2008).

The results of this study contribute to the cost management and strategy literatures. Using more homogenous classifications of differentiation and cost leadership strategies, we are able to identify a performance impact of ABCM in two of three strategy environments. Future research should examine more specifically how ABCM contributes to performance when used with complementary practices and different (or joint) strategic priorities.

Table 1. Focus of the competitive strategy

Rotated Component Matrix	Customer		
	Service	Low Price	Flexibility
High quality products/services	.727	.070	.048
Dependable delivery promises	.689	.346	.084
Effective service and support	.751	.097	.008
Customize to customers' needs	.577	-.201	.170
Low price	-.112	.677	-.017
Low cost of production/service	.073	.759	.082
Fast deliveries	.384	.557	.246
Product availability	.491	.539	.228
Unique features or services	.464	-.204	.622
Quick design changes	.099	.085	.860
Rapid volume/mix changes	-.038	.323	.761
Eigenvalue	2.5	2.0	1.9
Variance explained	23%	18%	17%
Coefficient alpha	.67	.65	.68

Extraction method: Principal component analysis

Rotation method: Varimax with Kaiser normalization

Bold indicates the factor loadings of the items that represent the factor.

See Appendix for list of actual questions. (N=264).

Table 2. Cross-Tabulation of Firms Pursuing Customer Service, Flexibility, and Low price Strategies

	High FL		Low FL		Total
	High CS	Low CS	High CS	Low CS	
High LP	43 Cell 1.1	28 Cell 1.2	30 Cell 1.3	27 Cell 1.4	128
Low LP	40 Cell 2.1	25 Cell 2.2	40 Cell 2.3	31 Cell 2.4	136
Total	83	53	70	58	264

High indicates standardized factor score for respective strategy factor is > zero.

Low indicates standardized factor score for respective strategy factor is ≤ zero.

LP = commitment to low price;

FL = commitment to flexibility;

CS = commitment to customer service;

“High FL” firms (cells 1.1 + 1.2 + 2.1 + 2.2): n = 136

“High CS” firms (cells 1.1 + 1.3 + 2.1 + 2.3): n = 153

“High LP” firms (cells 1.1 + 1.2 + 1.3 + 1.4): n = 128

Table 3. Firm Performance Factors

Rotated Component Matrix	PROFPERF	QUALPERF	SALESPERF
Return on investment	.837	.125	.085
Profit	.859	.145	.241
Cash flow from operations	.756	.244	.114
Cost control	.434	.589	-.081
Customer satisfaction	-.007	.680	.398
Employee satisfaction	.154	.771	.159
Internal process performance	.331	.750	.136
Development of new products	-.027	.356	.564
Sales volume	.252	-.040	.819
Market share	.160	.208	.791
Eigenvalue	2.4	2.2	1.9
Variance explained	24%	22%	19%
Coefficient alpha	.83	.75	.66

Extraction method: Principal component analysis

Rotation method: Varimax with Kaiser normalization

Bold indicates the factor loadings of the items that represent the factor. Data based on performance rating times the importance rating for each metric.

See Appendix for list of actual questions.

Table 4. Descriptive Statistics

	N	All Firms	High CUSTSERV	High LOWPRICE	High FLEXIBLE
<i>Total N</i>		264	153	128	136
MEANPERF	247	3.245	3.520	3.510	3.542
PROPERF	242	0.000	0.066	0.090	0.053
QUALPERF	242	0.000	0.241	0.232	0.171
SALESPERF	242	0.000	0.165	0.094	0.259
NOEMPL	264	4.129	4.131	4.344	4.221
MFG	264	0.810	0.830	0.859	0.875
ABCM	197	0.000	-0.007	-0.090	0.117
TEAMS	197	0.000	0.159	0.114	0.081
JIT	197	0.000	0.089	0.121	0.087
ISQUAL	197	0.000	0.117	0.008	0.027
NEWPROC	197	0.000	0.085	0.081	0.140
BSC	197	0.000	0.112	0.082	0.081
PROFANAL	197	0.000	-0.064	0.088	-0.165
PPA	251	5.223	5.315	5.317	5.229
CPA	251	4.392	4.569	4.601	4.234
BUDGET	197	0.000	0.124	0.066	0.037

Notes: MEANPERF refers to the mean of all performance x importance metrics (see Appendix).

PROFPERF refers to profitability performance; QUALPERF refers to quality performance, SALEPERF refers to sales performance (see Table 3 and Appendix for list of actual questions and descriptive data). ABCM refers to the stage of usage of activity-based costing/management (see Appendix for other practices).

“High CUSTSERV” refers to the group of firms with relatively high standardized factor scores for CUSTSERV (> zero). The same idea applies to “High LOWPRICE” and “High FLEXIBLE” (see Table 1 and Appendix for list of actual questions and descriptive data).

Table 5. Effects of Using ABCM with a Customer-service Strategy on Firm Performance (Hypothesis 1)

Panel A: ANCOVA results for key interactions

Dependent Var.	Key Interaction^a	R²	Adj. R²	MS	F	Sig.
PROFPERF	H1: CS01 x ABCM01 ^b	.124	.089	4.051	4.737	.031
	H1a: CS01 x ABCM01 x CPA01	.131	.075	.195	.225	.636
	H1b: CS01 x ABCM01 x ISQUAL01	.137	.082	.364	.422	.517
	H1c: CS01 x ABCM01 x BSC01	.179	.126	4.175	5.092	.025
QUALPERF	H1: CS01 x ABCM01	.187	.155	1.127	1.402	.238
	H1a: CS01 x ABCM01 x CPA01	.220	.171	.291	.369	.692
	H1b: CS01 x ABCM01 x ISQUAL01	.213	.163	2.994	3.760	.054
	H1c: CS01 x ABCM01 x BSC01	.231	.182	.579	.744	.390
MEANPERF	H1: CS01 x ABCM01	.305	.278	2.117	2.878	.092
	H1a: CS01 x ABCM01 x CPA01	.334	.293	.512	.710	.401
	H1b: CS01 x ABCM01 x ISQUAL01	.332	.290	3.981	5.502	.020
	H1c: CS01 x ABCM01 x BSC01	.349	.308	.036	.051	.822

Notes: PROFPERF refers to profitability performance; QUALPERF refers to quality performance, and MEANPERF refers to the mean of all performance x importance metrics. See Table 3 and Appendix for list of actual questions.

^a Each key interaction is part of an ANCOVA model with all main and interaction effects of the key interaction variables listed, and covariates FLEXIBLE, LOWPRICE, MFG, and NOEMPL.

^b CS01 refers to a binary (0,1) variable where 1 indicates a relatively high standardized factor score for CUSTSERV (> zero) and 0 indicates a relatively low factor score (≤ zero). ABCM01 is the same type of binary variable for ABCM, and so on for the other practices.

Table 5 (cont.)

Panel B: Contrast Tests Comparing High ABCM vs. Low ABCM groups (Test of H1)

Least Squares Mean Differences (Standard Errors) tested

Dep. Variable / High value groups	High ABCM Group	Low ABCM Group	Diff.	t-value	Sig.	
PROFPERF:						
H1: High CS01	0.368 (.14)	-0.175 (.12)	0.543	2.995	.003	Supports H1
H1a: High CS01 & CPA01	0.386 (.18)	-0.083 (.15)	0.469	1.961	.051	Supports H1
H1b: High CS01 & ISQUAL01	0.474 (.18)	-0.098 (.16)	0.572	2.409	.017	Supports H1
H1c: High CS01 & BSC01	0.367 (.17)	0.126 (.15)	0.241	1.073	.285	
QUALPERF:						
H1: High CS01	0.431 (.13)	0.120 (.11)	0.311	1.767	.079	
H1a: High CS01 & CPA01	0.530 (.17)	0.317 (.15)	0.213	0.933	.352	
H1b: High CS01 & ISQUAL01	0.496 (.17)	0.115 (.15)	0.381	1.667	.097	
H1c: High CS01 & BSC01	0.547 (.16)	0.165 (.15)	0.382	1.744	.083	
MEANPERF:						
H1: High CS01	3.773 (.13)	3.399 (.11)	0.374	2.231	.027	Supports H1
H1a: High CS01 & CPA01	3.837 (.16)	3.628 (.13)	0.209	0.963	.337	
H1b: High CS01 & ISQUAL01	3.922 (.16)	3.383 (.14)	0.539	2.478	.014	Supports H1
H1c: High CS01 & BSC01	3.960 (.16)	3.570 (.14)	0.390	1.872	.063	

Note: “High CS01” refers to the group with relatively high standardized factor scores for CUSTSERV (> zero). “High CS01 & CPA01” means relative high scores for both CUSTSERV and CPA (customer profitability analysis). “High ABCM Group” refers to the group with relatively high standardized factor scores for ABCM (> zero) and the “Low ABCM Group” refers to the group with relatively low standardized factor scores for ABCM (< zero).

Table 6. Effects of Using ABCM with a Low-price Strategy on Firm Performance (Hypothesis 2)

Panel A: ANCOVA results for key interactions

Dependent Var	Key Interaction^a	R²	Adj. R²	MS	F	Sig.
PROFPERF	H2: LP01 x ABCM01 ^b	.116	.081	1.518	1.759	.186
	H2a: LP01 x ABCM01 x ISQUAL01	.156	.102	5.633	6.685	.011
	H2b: LP01 x ABCM01 x BUDGET01	.145	.090	.040	.047	.828
	H2c: LP01 x ABCM01 x PROFANAL01	.124	.068	.338	.387	.535
	H2d: LP01 x ABCM01 x NEWPROC01	.136	.081	1.400	1.622	.205
QUALPERF	H2: LP01 x ABCM01	.287	.258	.239	.338	.561
	H2a: LP01 x ABCM01 x ISQUAL01	.312	.268	2.814	4.038	.046
	H2b: LP01 x ABCM01 x BUDGET01	.298	.253	.597	.841	.360
	H2c: LP01 x ABCM01 x PROFANAL01	.313	.270	.117	.168	.683
	H2d: LP01 x ABCM01 x NEWPROC01	.296	.251	.133	.187	.666
MEANPERF	H2: LP01 x ABCM01	.409	.386	.979	1.566	.212
	H2a: LP01 x ABCM01 x ISQUAL01	.421	.385	.981	1.566	.212
	H2b: LP01 x ABCM01 x BUDGET01	.435	.399	.081	.132	.717
	H2c: LP01 x ABCM01 x PROFANAL01	.432	.396	.345	.560	.455
	H2d: LP01 x ABCM01 x NEWPROC01	.424	.388	.052	.083	.774

Notes: PROFPERF refers to profitability performance; QUALPERF refers to quality performance, and MEANPERF refers to the mean of all performance x importance metrics. See Table 3 and Appendix for list of actual questions.

^a Each key interaction is part of an ANCOVA model with all main and interaction effects of the key interaction variables listed, and covariates CUSTSERV, FLEXIBLE, MFG, and NOEMPL.

^b LP01 refers to a binary (0,1) variable where 1 indicates a relatively high standardized factor score for LOWPRICE (> zero) and 0 indicates a relatively low factor score (\leq zero). ABCM01 is the same type of binary variable for ABCM, and so on for the other practices.

Table 6 (cont.)

Panel B: Contrast Tests Comparing High ABCM vs. Low ABCM groups (Test of H2)

Least Squares Mean Differences (Standard Errors) tested

Dep. Variable / High groups	High ABCM Group	Low ABCM Group	Diff.	t-value	Sig.	
PROFPERF:						
H2: High LP01	0.351 (.15)	-0.115 (.13)	0.466	2.306	.022	Supports H2
H2a: High LP01 & ISQUAL01	0.569 (.19)	-0.223 (.19)	0.792	2.955	.004	Supports H2
H2b: High LP01 & BUDGET01	0.409 (.19)	-0.119 (.19)	0.528	1.949	.053	Supports H2
H2c: High LP01 & PROFANAL01	0.361 (.23)	-0.015 (.16)	0.376	1.346	.179	
H2d: High LP01 & NEWPROC01	0.296 (.22)	-0.037 (.20)	0.333	1.135	.258	
QUALPERF:						
H2: High LP01	0.333 (.14)	0.109 (.12)	0.224	1.225	.222	
H2a: High LP01 & ISQUAL01	0.144 (.18)	0.275 (.17)	-0.131	-0.541	.589	
H2b: High LP01 & BUDGET01	0.386 (.18)	0.272 (.17)	0.114	0.462	.644	
H2c: High LP01 & PROFANAL01	0.452 (.20)	0.206 (.14)	0.246	0.995	.321	
H2d: High LP01 & NEWPROC01	0.409 (.20)	-0.049 (.18)	0.458	1.718	.088	
MEANPERF:						
H2: High LP01	3.631 (.13)	3.329 (.11)	0.302	1.770	.078	
H2a: High LP01 & ISQUAL01	3.692 (.17)	3.291 (.16)	0.401	1.734	.085	
H2b: High LP01 & BUDGET01	3.741 (.16)	3.285 (.16)	0.456	2.008	.046	Supports H2
H2c: High LP01 & PROFANAL01	3.701 (.19)	3.505 (.13)	0.196	0.843	.400	
H2d: High LP01 & NEWPROC01	3.664 (.19)	3.251 (.17)	0.413	1.657	.099	

Note: “High LP01” refers to the group with relatively high standardized factor scores for LOWPRICE (> zero). “High LP01 & ISQUAL01” means relative high scores for both CUSTSERV and ISQUAL. “High ABCM Group” refers to the group with relatively high standardized factor scores for ABCM (> zero) and the “Low ABCM Group” refers to the group with relatively low standardized factor scores for ABCM (< zero).

**Table 7. Effects of Using ABCM with a Flexible Strategy on Firm Performance
(Hypothesis 3)**

Panel A: ANCOVA results for key interactions

Dependent Var.	Key Interaction^a	R²	Adj. R²	MS	F	Sig.
PROFPERF	H3: FL01 x ABCM01 ^b	.126	.092	.004	.004	.947
	H3a: FL01 x ABCM01 x JIT01	.164	.111	2.139	2.565	.111
	H3b: FL01 x ABCM01 x TEAMS01	.137	.082	.002	.002	.965
	H3c: FL01 x ABCM01 x PPA01	.168	.115	.607	.732	.394
QUALPERF	H3: FL01 x ABCM01	.268	.239	.819	1.130	.289
	H3a: FL01 x ABCM01 x JIT01	.340	.298	4.488	6.716	.010
	H3b: FL01 x ABCM01 x TEAMS01	.370	.329	2.939	4.605	.033
	H3c: FL01 x ABCM01 x PPA01	.305	.260	.802	1.140	.287
MEANPERF	H3: FL01 x ABCM01	.383	.359	.132	.203	.653
	H3a: FL01 x ABCM01 x JIT01	.431	.395	2.882	4.678	.032
	H3b: FL01 x ABCM01 x TEAMS01	.437	.401	.440	.722	.397
	H3c: FL01 x ABCM01 x PPA01	.425	.389	.060	.097	.756

Notes: PROFPERF refers to profitability performance; QUALPERF refers to quality performance, and MEANPERF refers to the mean of all performance x importance metrics. See Table 3 and Appendix for list of actual questions.

^a Each key interaction is part of an ANCOVA model with all main and interaction effects of the key interaction variables listed, and covariates CUSTSERV, LOWPRICE, MFG, and NOEMPL.

^b FL01 refers to a binary (0,1) variable where 1 indicates a relatively high standardized factor score for FLEXIBLE (> zero) and 0 indicates a relatively low factor score (≤ zero). ABCM01 is the same type of binary variable for ABCM, and so on for the other practices.

Table 7 (cont.)

Panel B: Contrast Tests Comparing High ABCM vs. Low ABCM groups (Test of H3)

Least Squares Mean Differences (Standard Errors) tested

Dep. Variable / High groups	High ABCM Group	Low ABCM Group	Diff.	t-value	Sig.	
PROFPERF:						
H3: High FL01	0.139 (.13)	-0.175 (.14)	0.314	1.667	.097	
H3a: High FL01 & JIT01	0.281 (.16)	-0.436 (.20)	0.717	2.789	.006	Supports H3
H3b: High FL01 & TEAMS01	0.299 (.18)	-0.152 (.17)	0.451	1.834	.068	
H3c: High FL01 & PPA01	0.331 (.17)	0.087 (.20)	0.244	0.942	.347	
QUALPERF:						
H3: High FL01	0.284 (.12)	0.001 (.13)	0.283	1.634	.104	
H3a: High FL01 & JIT01	0.523 (.15)	0.068 (.18)	0.455	1.973	.050	Supports H3
H3b: High FL01 & TEAMS01	0.697 (.15)	0.073 (.15)	0.624	2.944	.003	Supports H3
H3c: High FL01 & PPA01	0.486 (.15)	0.209 (.18)	0.277	1.165	.245	
MEANPERF:						
H3: High FL01	3.584 (.11)	3.374 (.12)	0.210	1.281	.202	
H3a: High FL01 & JIT01	3.794 (.14)	3.220 (.17)	0.574	2.590	.010	Supports H3
H3b: High FL01 & TEAMS01	3.959 (.15)	3.438 (.14)	0.521	2.531	.012	Supports H3
H3c: High FL01 & PPA01	3.758 (.14)	3.713 (.17)	0.045	0.203	.839	

Notes: “High FL01” refers to the group with relatively high standardized factor scores for FLEXIBLE (> zero). “High FL01 & JIT01” means relative high scores for both FLEXIBLE and JIT. “High ABCM Group” refers to the group with relatively high standardized factor scores for ABCM (> zero) and the “Low ABCM Group” refers to the group with relatively low standardized factor scores for ABCM (< zero).

Table 8. Summary of Hypotheses Testing
(p-values from Tables 5-7, Panel B)

Hypothesis	Dependent Variables			
	PROFPERF	QUALPERF	MEANPERF	
<i>Archetypal strategies:</i>				
H1: CS & ABCM	.003	.079	.027	Supports H1
H1a: CS, ABCM, & CPA	.051	ns	ns	
H1b: CS, ABCM, & ISQUAL	.017	.097	.014	Supports H1b
H1c: CS, ABCM, & BSC	ns	.083	.063	
H2: LP & ABCM	.022	ns	.078	Supports H2
H2a: LP, ABCM, & ISQUAL	.004	ns	.085	Supports H2a
H2b: LP, ABCM, & BUDGET	.053	ns	.046	Supports H2b
H2c: LP, ABCM, & PROFANL	ns	ns	ns	
H2d: LP, ABCM, & NEWPROC	ns	.088	.099	
H3: FL & ABCM	ns	ns	ns	
H3a: FL, ABCM, & JIT	.006	.050	.010	Supports H3a
H3b: FL, ABCM, & TEAMS	.068	.003	.012	Supports H3b
H3c: FL, ABCM, & PPA	ns	ns	ns	

Note: p-values based on comparison tests reported in Panel B of Tables 5-7. A significant p-value suggests a statistically significant difference in firm performance between the group with relatively high commitment to the indicated strategy and high usage of ABCM and the group with relatively high commitment to the indicated strategy and low usage of ABCM.

“ns” = not statistically significant ($p > .10$)

Appendix: Survey Questions & Descriptive Data

Questions	N	Min.	Max.	Mean	S.D.
Competitive strategy: Respondents were asked, “Please indicate the emphasis placed on the following strategic priorities over the past three years: [1= no emphasis; 7 = great emphasis]”					
CUSTSERV (Customer service) ($\alpha=.67$)					
Provide high quality products or services	264	1	7	5.9621	1.1195
Make dependable delivery promises	264	1	7	5.7085	1.2403
Provide effective after-sale service and support	264	1	7	5.0965	1.5148
Customize products and services to customers’ needs	264	1	7	5.3688	1.4660
LOWPRICE (Low price strategy) ($\alpha=.65$)					
Low price	264	1	7	3.9357	1.5178
Low cost of production or service	264	1	7	4.7365	1.4763
Provide fast deliveries	264	1	7	5.2259	1.3702
Product availability	264	1	7	5.2882	1.3019
FLEXIBLE (Flexibility) ($\alpha=.68$)					
Provide unique product features or services	264	1	7	5.0606	1.4923
Make changes in design and introduce new products quickly	264	1	7	4.3272	1.7818
Make rapid volume and/or product mix changes	264	1	7	4.1728	1.5597
Management Techniques:					
TEAMS (Team structures) ($\alpha=.76$)					
Cross-functional teams ^a	243	1	7	4.5258	1.6909
Cross training and job rotation are required ^b	227	1	7	3.6377	1.5911
Employee teams are functioning and have been effective ^b	243	1	7	4.0753	1.4640
Workers are rewarded for quality improvement ^b	243	1	7	3.7942	1.6208
JIT (Just-in-time practices) ($\alpha=.78$)					
Just-in-time delivery of materials or component parts ^d	241	1	7	3.8606	1.8979
Materials or parts are delivered as needed rather than in large batches ^b	241	1	7	4.2863	1.7459
The plant layout is organized in flexible manufacturing cells ^b	227	1	7	3.8632	1.7373
Manufacturing practices are being oriented towards eliminating inventory ^b	241	1	7	4.5261	1.6957
Production is automatically halted if defective work is produced ^b					
Setup times are frequently reduced ^b					

Questions	N	Min.	Max.	Mean	S.D.
<i>ISQUAL</i> (Info. system quality) ($\alpha=.88$)					
Information systems across functions (sales, operations, etc.) are highly integrated ^c	256	1	7	4.3086	1.8392
Information systems within operations or manufacturing are highly integrated ^c	256	1	7	4.5211	1.7330
Overall, the information system offers user-friendly query capability to various users ^c	256	1	7	3.6250	1.6473
A wide array of cost and performance data is available in the information system ^c	256	1	7	3.9805	1.7387
Most data in the system are updated “real time” rather than periodically ^c	256	1	7	4.1364	1.9528
The quality of our current cost management information system is excellent ^c	256	1	7	3.4364	1.6410
<i>NEWPROC</i> (New processes) ($\alpha=.71$)					
Implementing new process or manufacturing methods ^a	261	1	7	4.6210	1.6426
Reengineering existing manufacturing or operating processes ^a	261	1	7	4.7110	1.5750
<u>Management Accounting Practices:</u>					
<i>ABCM</i> (Activity-based costing/management) ($\alpha=.83$)					
Activity-based costing ^d	245	1	7	2.8624	1.8892
Activity-based management ^d	245	1	7	2.6042	1.7677
Value chain analysis ^d	236	1	7	2.8517	1.9327
<i>BSC</i> (Balanced scorecard) ($\alpha=.88$)					
Balanced scorecard ^e	250	1	7	2.9624	2.1636
Benchmark product characteristics ^d	245	1	7	3.5925	2.0506
Benchmark operational processes ^d	245	1	7	3.5804	1.9366
Benchmark strategic priorities ^e	250	1	7	3.1880	1.8237
Benchmark management processes ^e	250	1	7	3.0480	1.7395
Benchmarking with other companies is tracked					
<i>PROFANAL</i> (Profitability analysis) ($\alpha=.71$)					
Product profitability analysis ^d	251	1	7	5.2234	1.6192
Customer profitability analysis ^d	251	1	7	4.3922	1.9201
<i>BUDGET</i> (Level of budgeting) ($\alpha=.89$)					
Long range planning ^e	253	1	7	4.4585	1.7804
Budgeting for evaluating managers’ performance ^e	254	1	7	4.0869	1.8926
Budgeting systems for planning cash flows ^e	254	1	7	4.4844	1.8018
Budgeting systems for planning financial position ^e	254	1	7	4.6982	1.7087
Budgeting systems for controlling costs ^e	254	1	7	4.8252	1.7603
Full participation of managers at all levels in developing budgets ^e	254	1	7	4.5827	1.9436

Questions	N	Min.	Max.	Mean	S.D.
Firm performance ratings: Respondents were asked, “Please assess your business unit’s performance relative to your industry competitors over the last three years across the following dimensions:” [1= significantly below average; 7 = significantly above average]					
Return on investment	244	1	7	4.5451	1.3646
Profit	247	1	7	4.6194	1.3678
Cash flow from operations	246	1	7	4.7927	1.4090
Cost control	248	1	7	4.3750	1.3135
Development of new products	244	1	7	4.2951	1.4298
Sales volume	249	1	7	4.6064	1.1904
Market share	245	2	7	4.7265	1.2523
Customer satisfaction	251	2	7	5.2430	1.1067
Employee satisfaction	247	1	7	4.4980	1.3491
Internal process performance	246	1	7	4.1748	1.3271
Overall mean performance rating	251	1	7	4.5916	0.8703

Importance ratings: Respondents were asked, “Please rate the **importance** placed by top management on the following dimensions when evaluating the performance of your business unit:” [1= not important; 7 = extremely important]

Return on investment	260	1	7	5.0716	1.5975
Profit	260	1	7	5.9619	1.0196
Cash flow from operations	261	1	7	5.4966	1.4637
Cost control	260	1	7	5.2192	1.3901
Development of new products	260	1	7	4.4263	1.6732
Sales volume	260	1	7	5.6024	1.1862
Market share	260	1	7	4.8850	1.4005
Customer satisfaction	260	1	7	5.7268	1.2545
Employee satisfaction	258	1	7	4.2209	1.5562
Internal process performance	258	1	7	4.4496	1.4277
Overall mean importance rating	261	1	7	5.0998	0.8229

Notes:

- ^a “Please indicate the extent of usage of each of the following **operating initiatives** over the past three years:” [1= not used; 7 = high usage]
- ^b “Please evaluate the following statements about your **operating techniques** for your business unit:” [1= strongly disagree; 7 = strongly agree]
- ^c “Please evaluate the following statements about your business unit’s **information system** for your business unit:” [1 = strongly disagree; 7 = strongly agree]
- ^d “For each of the following cost management practices, please indicate the stage of usage over the past three years using the following scale: **1 = not considered seriously; 2 = rejected/abandoned; 3 = considering implementation; 4 = implementation has begun; 5 = use somewhat; 6 = use moderately; 7 = use extensively**”
- ^e “Please indicate the extent of usage of each of the following **strategic planning and control** activities over the past three years:” [1= not used; 7 = high usage]

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Endnotes

¹ Kaplan and Cooper (1998, 137) define activity-based management as “the entire set of actions that can be taken, on a better informed basis, with activity-based cost information.”

² *Prospectors* take an aggressive new product-market position within broadly defined markets and tend to be industry pioneers in the creation and development of new technologies. *Defenders* often take a conservative view of new product development and attempt to maintain a secure market position in a narrower segment of the market, competing on price or quality and rarely introduce new technologies to the market. *Analyzers* represent elements of both prospector and defenders strategies, maintaining a secure market position within a core market but also seeking new market positions through product development. *Reactors* are characterized by the absence of any well-developed plan for competing within an industry. For a good discussions comparing the Miles and Snow (1978) prospector-defender typology and the Porter (1980) differentiation-cost leadership typology, see Govindarajan (1986) and Walker and Ruekert (1987).

³ Because the “focus” approach includes one or both of the other two approaches but aimed at a particular target segment, prior research using this framework typically uses only the first two approaches (i.e., differentiation and cost leadership) (Chenhall and Langfield-Smith (1998).

⁴ Techniques included hand-addressing and stamping envelopes, hand-signing the cover letters and reply cards, attaching a hand-written, personalized note requesting the individual’s participation in the study, and mailing a “friendly reminder” postcard (after two weeks) and a second survey (after four weeks) to individuals who had not returned the reply card from the first mailing. The two survey mailings in late 2001 included a reply card separate from the survey, asking the individual to indicate whether the survey was completed or why he/she was unable to complete the survey. The information from the reply cards allowed the second survey mailing to

be sent only to individuals who had not returned the reply card from the first mailing. In addition, the reply cards provide information about the nonrespondents.

⁵ First, we analyzed the 99 individuals who did not respond to the survey but returned the reply card. Forty-nine said they are either a consultant, full-time professor, unemployed, or retired. Of the rest, 28 said their company has a policy against responding to surveys, and 22 either did not have the information, felt the survey was not applicable or helpful to them, or had changed employment. Second, a comparison was made of the survey respondents with known characteristics of the CMG membership (industry and job title). No significant differences were found. Third, the early responses were compared with the later responses for firm characteristics including contextual factors, ABCM usage, and firm performance. No significant differences at the $p < 0.05$ level were found between early and late respondents.

⁶ Although we generally use the same strategy questions as Chenhall and Langfield-Smith (1998), we classify the questions somewhat differently. They used factor analysis to determine which questions loaded together and labeled the resulting three groups as *Customer service*, *Low price*, and *Flexibility*. Some of the questions in the resulting groups seemed out of place. For instance, “Low cost of production or service” was included in the *Flexibility* group and “Product availability” was in the *Low Price* group. We also used factor analysis and found both questions loaded with the “low price” factor (see Table 1). We also tested the same groupings used by Chenhall and Langfield-Smith (1998) and the resulting Cronbach alphas were all lower than the factor groupings used in this study and below accepted reliability norms (Nunnally 1967). The resulting groupings are also slightly different than those in Hyvonen (2007), which also differ somewhat from Chenhall and Langfield-Smith (1998).

⁷ To test for external validity, we compared the percentage of firms in each group with the percentages in the Chenhall and Langfield-Smith (CLS) (1998) and Lillis and van Veen-Dirks (LVD) (2008) studies. The results are as follows:

Group	CLS	LVD	Current study
Joint strategies	9 (13%)	33 (39%)	101 (38%)
Archetypal-differentiation	34 (47%)	44 (52%)	105 (40%)
Archetypal-low price	9 (13%)	5 (6%)	27 (10%)
Neither	<u>20 (27%)</u>	<u>2 (2%)</u>	<u>31 (12%)</u>
	72 (100%)	84 (100%)	264 (100%)

The categorization compares fairly closely to that of LVD overall. It should be noted the table above differs from LVD’s Table 5, which defined differentiation firms as volume flexibility only. The table above defines differentiation as including all three of their differentiation strategies. In LVD’s Table 5, the percentages were 27%, 30%, 18%, and 25%, respectively. The LVD study had relatively more archetypal-differentiation firms (52% vs. 40%) and fewer archetypal-low price strategy firms (6% vs. 10%) and fewer “neither” firms (2% vs. 12%). There are some differences between the three studies that should be noted here. First, both the CLS and LVD studies were of manufacturing firms only while this study includes both manufacturing and non-manufacturing firms. It also used different strategy questions than the current study. Finally, the CLS classifications are based on cluster analysis along with non-strategy factors, so the classifications are not “pure” strategy groups. In addition, we also conducted post-survey telephone or email interviews with 21 survey respondents (who provided their name and contact information) to validate our classifications of their firm’s strategic focus. The literature suggests that each method of classifying strategies provides a somewhat different result, and no standard exists for a satisfactory level of consistency (Ketchen & Shook 1996).

⁸ The question used to measure number of employees had seven categories: [1] Under 50 (22 firms), [2] 51-100 (27 firms), [3] 101-200 (46 firms), [4] 201-500 (56 firms), [5] 501-1,000 (41

firms), [6] 1,001-10,000 (57 firms), [7] Over 10,000 (15 firms). The average response was 4.13 (s.d. 1.69).

⁹ Note that the number of firms included in the analysis in Tables 5-7 are less (N=185 to 187) than the total number of firms in the study (N=264). As shown in Table 4 and Appendix, several respondents did not answer all of the ABCM or performance questions.