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The Impact of Activity-Based Costing Techniques on Firm Performance

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Abstract: Given the debate in both the professional and scholarly literature on the effectiveness of management accounting systems in the contemporary business environment, there is a need to understand more about the impact of activity-based costing (ABC). In this paper, we show that the choice of a management accounting system, such as ABC, may have a significant impact on firm value. Specifically, for a sample of U.K. firms, we show that firms adopting activity-based costing techniques outperform matched non-ABC firms by approximately 27 percent over the three years beginning on January 1 of the year in which the ABC techniques are first implemented. This result is robust to different matching criteria and for both accounting and market-based measures of performance. Further analysis suggests that ABC adds to firm value through better cost controls and asset utilization, coupled with greater use of financial leverage.

Keywords: activity-based costing; abnormal returns; holding period returns; firm performance.

INTRODUCTION

The availability and relevance of accounting information underlies many business decisions. In recent years, traditional volume-based cost models have been the subject of much criticism, especially in relation to the accuracy of product costing. The popularity of activity-based costing (ABC) in the mid-1980s and the subsequent evolution (Bromwich and Bhimani 1989) vs. revolution (Johnson and Kaplan 1987) debate has enriched both the management accounting literature and practice. Research to date, however, has concentrated on assessing the integrity of the ABC process (for example, Foster and Gupta 1990; Noreen 1991; Roth and Borthick 1991; Banker and Johnston 1993; McGowan 1998; Maher and Marais 1998); examining its application and implementation in a single case study situation (for example, Cooper and Kaplan 1999); assessing the degree of interest and adoption (for example, Nicholls 1992; Armitage and Nicholson 1993; Innes and Mitchell 1995, 1997; Malmi 1999); and factors impacting the success of implementation (for example, Anderson 1995; Shields 1995; Foster and Swenson 1997;

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Anderson and Young 1999). Despite the assertion of Cooper and Kaplan (1992) that "the goal of ABC is to increase profits, not to obtain more accurate costs," little attempt has been made to examine empirically the relationship between the adoption of ABC and the creation of shareholder value through increased profits. Therefore, the prime purpose of this paper is to see whether the many documented successful case study implementations of ABC are, on average, translated into superior stock performance.

Using mail surveys, we identify a sample of 47 firms listed on the London Stock Exchange (LSE) that adopted ABC between January 1988 and February 1996. We also identify 183 firms that had not adopted ABC before the end of February 1996. We match each adopting firm at the beginning of the year in which they first adopted ABC with a non-adopting firm from the same industry and of approximately the same market capitalization. Despite the limited number of confirmed non-adopters in our sample, we were able to match 37 of the 47 ABC-adopting firms within a reasonable level of accuracy. Next we computed buy-and-hold returns for the ABC-adopting firms and their matched counterparts for the three-year period beginning in the year of adoption and continuing for the subsequent two years. Our results reveal a three-year return of 61 percent for the ABC-adopting firms, compared to 34 percent for their non-adopting counterparts, the difference being significant at the 5 percent level.

We perform several robustness checks on our data. First, we use nonparametric methods to confirm that the proportion of ABC adopters that outperform their matched counterparts is greater than 50 percent. Second, we use two alternative matching criteria, one based on market-to-book ratio, the other on net total assets. Third, we use Ritter's (1991) cumulative abnormal return (CAR) method as an alternate to the buy-and-hold method to measure abnormal returns. Fourth, we use the FTSE-100 index as a market surrogate to compute market-adjusted returns rather than matched-firm-adjusted returns. Fifth, we review the two-year pre-adoption market performance of both the ABC firms and their matched counterparts in order to test for the overreaction/underreaction phenomena. Our results show that there was no difference in the performance of our ABC firms and their matched counterparts prior to the adoption of ABC. Finally, we report the difference between the ABC firms and their matched counterparts under a range of accounting-based measures of performance. In all cases, we find evidence of significant superior performance by the ABC-adopting firms.

As with many cross-sectional studies, our results must be interpreted with caution. Other factors, unknown to us but common to our 47 ABC-adopting firms may be the underlying cause of the superior performance we document. We attempt to address these concerns by examining company announcements in the period surrounding the adoption of ABC. We find no difference between our ABC-adopting firms and their matched counterparts, either in the year before, or the three years following the adoption of ABC, in terms of significant corporate events such as new capital raised, acquisitions, and divestitures. It is possible however, that the implementation of other strategic initiatives that coincide with the adoption of ABC may be the cause of the abnormal returns we document. Thus, despite the strong and robust evidence in this paper, it is not possible to prove definitively that there is a causal link between ABC adoption and subsequent increases in shareholder value.

The structure of the paper is as follows. Section two presents a brief review of the ABC literature and a summary of the attributes and characteristics of ABC, as interpreted in this study. It also sets out the hypothesis and the theoretical model underpinning this study. Section three documents the research method and data

source used. Section four presents the research findings. Section five summarizes the results of the robustness tests. The paper concludes in section six with a summary and interpretation of the findings, as well as a discussion of the limitations of the study.

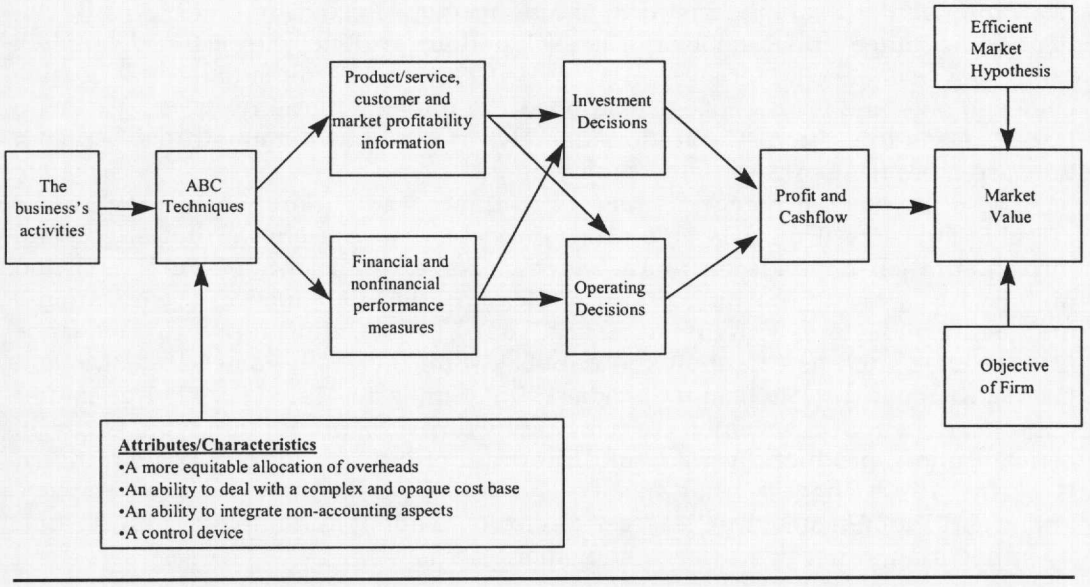
LITERATURE AND HYPOTHESIS DEVELOPMENT

This study examines the link between implementation of an activity-based costing system and the Shareholder Value Analysis (SVA) framework of Rappaport (1986). This linking of ABC to value creation is depicted in Figure 1.

Given the SVA framework of analyzing how business decisions affect "economic value" through the identification of the key value drivers (Wenner and Le Ber 1989), ABC can provide information crucial to an understanding of how a firms' competitive advantage is generated. Shank and Govindarajan (1993) highlight such an approach by asking two questions: is the activity necessary, and is the activity performed efficiently? They label this approach as "value engineering the cost structure." By more accurately attributing cost to products, services, and customers, ABC can play an important role in providing relevant information for management operating decisions, which, in turn, should impact on profitability and, ultimately, shareholder value. Ward and Patel (1990) also suggest that ABC provides a sound foundation for future cash flow projections. They argue that this leads to investment in value-added activities that support products, services, customers, and market segments, thereby increasing shareholder value.

The Schrader Bellows (Cooper and Weiss 1985), John Deere Component Works (Kaplan 1987) and Tektronix (Cooper and Turney 1988) cases were the "original" ABC systems to be documented in detail. The concept has been further developed by the application of Activity Based Budgeting (Morrow and Connolly 1991), Activity Based Management (Campi 1992; Turney 1992), Activity Based Computing (Bentley 1993), Activity Based Cost Management (Clarke 1994), and its full infusion into the business process re-engineering framework (Brimson and Fraser

FIGURE 1
The Link between ABC and Market Value
Adapted from Ward and Patel (1990)



1991). The activity-based approach has also been used as a base for applications such as benchmarking, cost reduction, and transfer pricing (Morrow and Ashworth 1994). Further, the evolution of the "balanced scorecard" concept (Kaplan and Norton 1992), and its subsequent refinement as the organization's central management system (Kaplan and Norton 1993; Hoffecker and Goldenberg 1994), contextualizes the application of ABC.

Even though the ABC concept was initially developed in a manufacturing context, it can be applied equally well in the services sector, as activities are universal to all organizations. Cooper and Kaplan (1992) and King et al. (1994) document successful applications in the telecommunications, transport, wholesale and distribution, marketing, health, and information services sectors. Innes and Mitchell (1997) document its successful application in the U.K.'s largest financial institutions.

Malmi (1999) cautions that there is no common view of what makes an accounting system an ABC system. For the purposes of this study, we therefore regard ABC as a generic term to describe an alternative paradigm to traditional volume-based cost models with the following key attributes:

(1) a more equitable allocation of overheads by identifying the underlying "driver" of activities;

(2) a "new technology" capable of dealing with an increasingly complex and opaque cost base;

(3) a process of activity identification with the ability to integrate nonaccounting aspects; and

(4) a control device in the spirit of "panopticon" and built upon the knowledge created through the management information system.

Within this framework ABC can be viewed as a cost and performance management model capable of contributing significantly to operational improvements and strategy formulation (Kaplan and Cooper 1998). It is also consistent with Porter's (1985) value-chain concept and its development by Shank and Govindarajan (1993) in a strategic management accounting context.

Gosselin (1997) notes that despite the perceived advantages of ABC and the interest shown by academics and management accountants, adoption has not been intense (for example, Institute of Management Accountants 1993 [U.S. evidence]; Armitage and Nicholson 1993 [Canadian evidence]; Innes and Mitchell 1995 [U.K. evidence]). Moreover, Horngren (1990) and Nanni et al. (1992) provide evidence on some firms that have stopped the implementation process. Gosselin (1997) terms this the ABC paradox, namely, "if ABC has demonstrated benefits, why are more firms not actually employing it?"

There are several potential answers to this paradox. First, ABC may not be suitable for every firm. A large strand of recent research shows that successful implementation depends on many aspects. For example, Anderson (1995) and Malmi (1997) argue that successful implementation depends on organizational and technical factors, with Anderson and Young (1999) citing supporting evidence from studies such as Chenhall and Langfield-Smith (1998), Foster and Swenson (1997), Krumwiede (1998), and Shields (1995). Similarly, Malmi (1999) argues that adoption depends on several factors including firm size, production type, degree of centralization, product diversity, and the ratio of indirect to total costs. Finally, Gosselin (1997) suggests that specific characteristics in their business strategy and organizational structure lead certain firms to adopt and implement ABC and, by implication, other firms not to implement ABC.

Second, ABC may not, *per se*, add value, but may merely be correlated with other variables that are the true value drivers. Alternatively, the control system may have an indirect rather than a direct effect on performance through an intervening variable that mediates the relationship between the control system and the performance measure (Shields et al. 2000). For example, Piper and Walley (1990) claim that the advocates of ABC only show success stories and in so doing attribute all or most of that success to one item—the ABC system. They describe this as a "logical fiction" as, in reality, any result is due to a number of separate, different, concomitant events and to attribute blame or credit to one particular reason is not always correct. They conclude by saying that ABC does not stand up to close scrutiny because it has not yet been empirically tested or logically established. Later, Piper and Walley (1991), in reviewing some of the early case studies (Siemens, John Deere Component Works, and Tektronix [Cooper and Kaplan 1999]), posit a counterthesis, namely, that it is strategic decisions and not activities that cause costs. Bromwich and Bhimani (1994), in comparing ABC to other cost systems, traditional or otherwise, contend that the "superiority of one costing system over another cannot be established unambiguously." They propose that ABC has not succeeded in addressing the problem of the "overhead blob" because it does not absorb the "facility sustaining costs" into products. They conclude that "the evidence and arguments advanced by advocates of wholesale change in management accounting are not yet sufficient to justify the wholesale revision of management accounting."

Third, little evidence has been presented that documents a direct link between a change to an ABC system and increases in either shareholder value or firm profitability. As Gordon and Silvester (1999) conclude, adoption of ABC has to be seriously questioned if a positive market effect cannot be clearly established. Absent such a link, many firms may be reluctant to change to an ABC system that requires considerable investment. For example, Bromwich and Bhimani (1989) argue that even though "it is known that activity costing changes product costs substantially, there is as yet little to suggest that it enhances profitability." Innes and Mitchell (1990a) support this view by stating unequivocally that there is "no evidence to date that ABC improves corporate profitability."

This study focuses on the third potential explanation of Gosselin's (1997) paradox, the existence of a causal link between the introduction of ABC and firm performance. A large literature has evolved examining the impact of specific events such as management choices or decisions on firm value. Such studies are generally referred to as event studies and early examples include earnings announcements (Ball and Brown 1968), stock splits (Fama et al. 1969) and seasoned equity offerings (Asquith and Mullins 1986). The widespread use and acceptance of the event-study method has, in turn, led to a well-established research methodology (Brown and Warner 1980, 1985).

Most event studies have focused on events that are easily identified and where a clear adoption date can be established. A few studies, however, have attempted to examine the effect of strategic management choices on firm performance in cases where it is difficult to specify the exact date of implementation. For example, Haka et al. (1985) examined value implications following the adoption of discounted cash flow capital budgeting techniques and found no evidence of superior market performance for firms adopting these sophisticated techniques. In contrast, Easton and Jarrell (1998) found compelling evidence that implementation of Total Quality Management (TQM) is associated with superior long-term performance using both accounting- and market-based measures of performance.

Gordon and Silvester (1999) do use an event-study approach in examining the impact on firm value of an announcement that the firm was using ABC. Their study

examines the performance of ten firms identified as ABC users in a May 30, 1988 article in the magazine, *Business Week*. While the ABC firms do have positive abnormal returns on the publication date, so do ten size- and industry-matched control firms. As the difference in the returns to the ABC firms is not significantly different (at conventional levels) from their matched counterparts, Gordon and Silvester (1999) conclude that the announcement of ABC use does not affect firm values.

In summary, Cooper and Kaplan (1992) argue that the ultimate aim of ABC is to increase profits. The associated literature suggests that provided the techniques are implemented effectively, with the support of all, then increases in sales and/or reductions in expenses should follow. Given these profit implications, additional value should accrue to those firms that adopt the techniques. The general hypothesis examined in this study is, therefore:

Ho: There is no difference in the performance of a portfolio of firms adopting ABC when compared with a set of matched firms that do not employ ABC.

RESEARCH METHOD AND DATA

Strategic discretionary decisions, such as a change to an ABC system, introduce three special problems to the event-study method. First, it is difficult to specify an exact event date. Firms do not usually announce the change to an ABC system, and the feasibility phase and subsequent implementation can take many months, or even years. Second, because of the lack of a specific public announcement related to the event, the market may take time to learn of the introduction and hence to reflect a change in valuation. As Gordon and Silvester (1999) suggest, the market may not fully understand the implications of the adoption of ABC and it may take an external event (such as the *Business Week* article in their study) to bring this information to the attention of the market.

Consequently, stock price reaction to the introduction is likely to be gradual and may last for an extended period of time. It is also likely to extend for different periods for different companies. Third, as Barber and Lyon (1997) show, abnormal returns computed over extended periods can be severely biased. In the subsections below, we describe how we attempt to address each of these problems.

Sample and Data Collection

The top 1,000 firms in the U.K. as listed by *The Times 1,000* (1995) (ranked by turnover) and *The Times 1,000* (1996) (ranked by capital employed[1]) were chosen as the appropriate sample frame. We integrated both listings due to the change in ranking criteria that had been adopted for those two years. This minimizes the bias in favor of manufacturing firms and results in the inclusion of a greater number of financial sector firms in our sample. Finally, as share price returns were used as a proxy for firm performance, we excluded firms not publicly listed. This resulted in a final population of 853 firms.

This sample frame was chosen because of its accessibility, the maturity of its financial market, and previous research demonstrating strong interest in ABC systems (Innes and Mitchell 1995). It also reflected the view of Cobb et al. (1992) that as the implementation of ABC caused a "considerable drain on accounting resources," they would be considered more seriously by larger firms than smaller

[1] Defined as "shareholders funds *plus* long term loans (where separately disclosed) *plus* intra-group payables *plus* deferred liabilities *less* (for insurance companies) technical reserves" (The Times 1,000 1996).

firms. In addition, as the phenomenon in an applied state was of fairly recent origins, the firms with the greatest access to resources of people or technology and those engaged in ongoing strategic evaluations were the most likely to have given it serious consideration.

A mail questionnaire survey was used to establish those firms that had (or had not) adopted ABC and when the adoption took place. It also asked if any of the adopting firms had subsequently abandoned ABC. There is no universal agreement on what makes an accounting system an ABC system (Malmi 1997). We therefore follow Malmi and allow the firm to identify if they used ABC and, if so, the year in which it was first adopted. Specifically, we classify any firm that indicates the use of any ABC technique as an ABC firm for the purposes of our study.

We began by testing the survey instrument using a sample of Irish firms. Then we determined the name of the finance director at 555 of the 853 U.K. sample firms. To improve the response rate, we included a cover letter to these 555 finance directors, by name, setting out the reason for the study, its practical value, and emphasizing the importance of a large response. This is similar to the procedure discussed in Gosselin (1997). For the remaining 298 firms where we were unable to determine an individual name, the cover letter was directed to the "Finance Director." In addition, the cover letter assured each respondent of complete confidentiality, promised to send respondents the aggregate results, and was personally signed by one of the authors. A self-seal, prepaid envelope was included and a reply fax number was also provided. A specific response date of Friday, March 22, 1996 was highlighted on the cover letter, after which a telephone follow-up exercise took place. This telephone follow-up exercise concluded on Friday June 14, 1996. The Appendix provides a copy of our questionnaire.

In conducting the telephone follow-up process, up to four attempts were made to reach the potential respondent in each firm. During this process, a number of firms were unable to locate the survey documentation and asked for another copy. Forty-five follow-up letters and questionnaires were sent during this phase of the project. By the end of the process, 1,696 telephone calls had been logged.

19.2 percent of those surveyed responded via mail and 75.6 percent responded by telephone/fax, giving a total response rate of 94.8 percent. However, while 94.8 percent of the sample firms were explicitly contacted, either through the mail survey or telephone call, only 27.4 percent (n = 234) answered the questionnaire in sufficient detail to facilitate further analysis. Further, by dating the postal responses and keeping a record of the daily telephone calls, we were able to compare the respondents over time (Oppenheim 1992). We found no significant difference between those firms that responded early and those that responded late, and conclude that there is no evidence of nonresponse bias in this study.

Table 1 provides a breakdown of all respondents for this study, the Innes and Mitchell (1995) and Innes et al. (2000) studies. Analysis of the reasons for failure to complete the questionnaire shows that of the total sample, 34.2 percent were "too busy" to respond, 23.8 percent had a specific policy not to respond to surveys, 6.3 percent indicated they were unlikely to respond and, finally, 3.1 percent of the responses were unusable. Removing all responses that were unusable or incomplete left 234 firms available for further analysis. Of these, 47 firms (20.1 percent) used ABC, in contrast with 49 firms (19.5 percent) found in the Innes and Mitchell (1995) study and 31 firms (17.5 percent) in Innes et al. (2000). In addition, 187 firms explicitly identified themselves as non-ABC users.

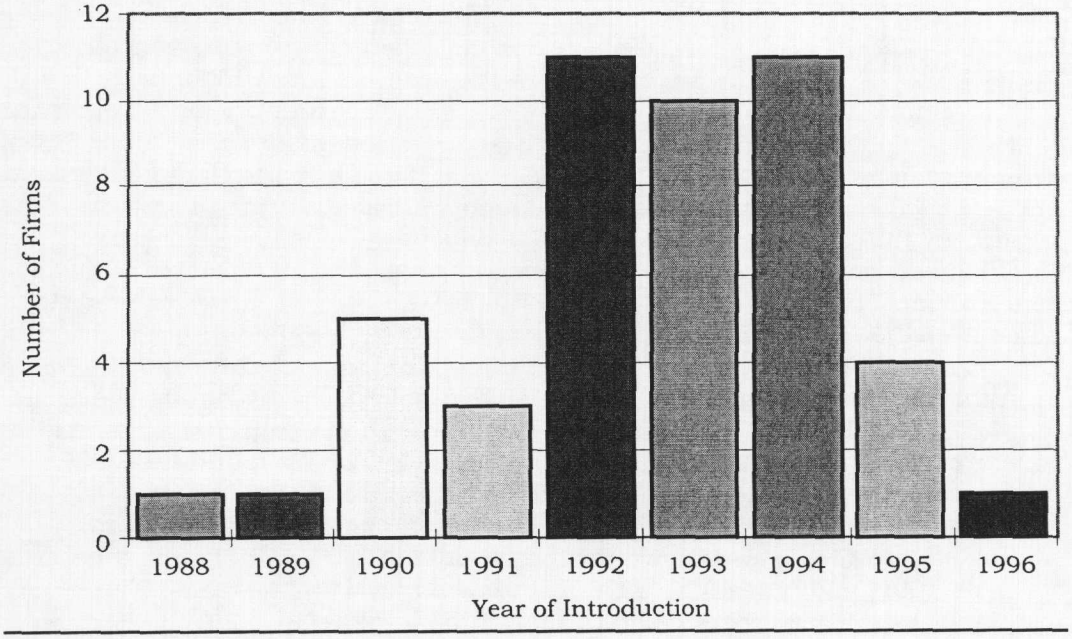
Figure 2 indicates the year in which each of the 47 ABC-adopting firms first introduced the concept. Given the interest that the concept generated in both the academic and professional communities in the late 1980s, a significant

TABLE 1
Analysis of Survey Results

Analysis of Respondents	This Study		Innes and Mitchell (1995)		Innes et al. (2000)	
	n	%	n	%	n	%
ABC users	47*	5.5	49*	4.9	31*	4.0
Non-ABC users	187	21.9	202	20.2	146	18.8
Total-usable responses	**234**	**27.4**	**251**	**25.1**	**177**	**22.8**
Too busy	292	34.2	23	2.3	NA	—
Policy not to respond	203	23.8	51	5.1	NA	—
Unlikely to respond	54	6.3	NA	—	NA	—
Unusable	26	3.1	31	3.1	32	4.1
Other	NA	—	83	8.3	139	17.9
No response	44	5.2	561	56.1	427	55.1
Total Sample Size	**853**	**100**	**1,000**	**100**	**775**	**100**

* 20.1 percent, 19.5 percent, and 17.5 percent of total usable responses, respectively.

FIGURE 2
When was ABC Introduced?



implementation rate was to be expected in the early 1990s. The results of our survey indicate that this was achieved primarily in the years 1992 to 1994. It is also important to note that none of the respondents to our survey indicated that they had introduced and subsequently abandoned the ABC approach.

The Matching Process

Our main results are based on a comparison between the ABC-adopting firms and a matched sample of similar, but non-ABC firms. This is similar to the approach followed by Gordon and Silvester (1999). From our survey, we identified 47 firms that had adopted ABC, together with the year of adoption for each firm. We also identified 187 firms that had not adopted ABC. As Easton and Jarrell

(1998) note, the use of control firms is critical to control for common factors that effect similar types of firms in the performance measurement period and are not related to the adoption of ABC.

The precise time of the introduction of ABC is not an easily discernible event, unlike, for example, an acquisition decision or an earnings announcement. Consequently, there is not a specific, easily identified date that can be associated with the introduction of an ABC system. Both our survey and the Innes and Mitchell (1995) survey found that firms consider the adoption of ABC over a period of time, often with the assistance of external consultants. Even after deciding to adopt an ABC system, it can take many months of planning and development before the system is finally implemented. Because of the difficulty in establishing an exact event date, we follow Haka et al. (1985) and choose January of the year in which the firm indicated they first used ABC as the adoption date. All performance comparisons are done relative to this January date.

Because firms seldom make a specific public announcement of a change to an ABC system, an instantaneous response to the introduction would not be expected. Hence we do not use a standard event study approach. Rather, we use a performance assessment window of three years to capture the effect, if any, of the introduction on firm performance. This recognizes the time it takes to fully implement such a system and the potential "lag" effect discussed in other studies such as the TQM study of Easton and Jarrell (1998) who examine five-year post-event performance, and Haka et al. (1985) who use a 48-month period to examine the impact of a change in capital budgeting methods. It is also consistent with the growing literature on long-term trends in stock market prices (for example, Ritter 1991; Spiess and Affleck-Graves 1995). While most empirical evidence of this latter phenomenon is from the U.S., Levis (1993) has shown similar evidence for the U.K. stock market, the database chosen for this study.

We matched firms on December 31 in the year prior to the adoption of ABC. Three different matched samples were established, based on market capitalization, market-to-book ratio, and net-total-assets. Market capitalization was used to control for firm size, a variable that Banz (1981) and others have shown is related to stock returns. Matches by market-to-book were used in response to the findings of Fama and French (1992) and net-total-assets was used as a size measure of balance sheet value. Throughout the exercise, no firm was used more than once as a matched firm within a three-year time frame.

The specific matching procedure was as follows.

(1) ABC firm i was matched with all non-ABC firms in the same level 4 (Datastream) industry classification and within 25 percent of its market capitalization. If more than one match was found, then the non-ABC firm with the market capitalization closest to firm i was chosen as the match.

(2) If no match was found in the level 4 industry classification within 25 percent, the process in (1) was repeated using the level 3 industry classification. If no match was again found, then the process was repeated at level 2.

(3) If no match within 25 percent of the market capitalization of firm i could be found in the 187 non-ABC firms, then the entire process was repeated using 50 percent of the market capitalization of firm i.

This procedure gave first priority to the market capitalization difference and secondary status to the industry-level match. Similar procedures were used to identify the market-to-book and net-total-assets matched samples. The final market capitalization-matched sample contains 37 firms, while the market-to-book and net-total-asset samples contain 38 and 33 firms, respectively.

Table 2 presents an industry profile of the three sets of matched ABC sample firms, based upon Datastream level-3 industry classification codes. It reveals that all the major industries in the U.K. economy are represented and confirms that the process has also been applied outside the manufacturing sector. The results of the three matching procedures are summarized in Table 3.

It is worth noting from Table 3 that 76% of the firms in the case of market capitalization, 84% in the case of market-to-book and 82% in the case of net-total-assets were matched within the level 3-industry classification.[2]

Descriptive statistics indicating the accuracy of our matching procedure are presented in Table 4. They show that the market capitalization data set achieved the best match as there were no statistically significant differences (at the .10 level) between the ABC and non-ABC firms in terms of mean market capitalization, market-to-book ratio, or net-total-assets.

[2] We also used the less onerous restriction of matching within 75 percent of market capitalization and going to industry level 1. This increased the market capitalization-matched sample size by 6 firms (0 and 1 in the case of the market-to-book and net-total-assets samples, respectively). All results are qualitatively the same between the larger sample and the results we report using the smaller sample size.

TABLE 2
Profile of ABC Matched Sample Firms

Description (Level 3)	Market Capitalization		Market-to-Book		Net Total Assets	
	No. Firms	%	No. Firms	%	No. Firms	%
General Industries	14	37.84	11	28.95	10	30.30
Utilities	7	18.92	9	23.68	7	21.21
Financials	6	16.22	8	21.05	5	15.15
Consumer Goods	7	18.92	8	21.05	8	24.24
Services	3	8.11	2	5.26	3	9.09
Total	37	100.00	38	100.00	33	100.00

TABLE 3
Summary of Matched Sample Process

Industry Level	Matched within %	No. Firms Matched	% Firms Matched	Cumulative % of Sample
Panel A: Market Capitalization Sample (37 firms)				
4	25%	10	27	27
3	25%	18	49	76
2	25%	9	24	100
Total		37	100	
Panel B: Market-to-Book Sample (38 firms)				
4	25%	18	47	47
3	25%	14	37	84
2	25%	5	13	97
3	50%	1	3	100
Total		38	100	
Panel C: Net-Total-Assets Sample (33 firms)				
4	25%	11	33	33
3	25%	16	49	82
2	25%	6	18	100
Total		33	100	

TABLE 4
Mean Comparison of ABC and Non-ABC Samples

Match Criteria	ABC Firms (Mean)	Non-ABC Firms (Mean)	Difference (t-statistic)	p-value
Panel A: Market Capitalization Sample (37 firms)				
Market Capitalization	1,504.35	1,421.68	1.1815	.1226
Market-to-Book	2.61	3.41	–0.4817	.3167
Net-Total-Assets	861,740	955,447	0.6642	.2557
Panel B: Market-to-Book Sample (38 firms)				
Market-to-Book	2.51	2.31	1.4401	.0791*
Market Capitalization	3,413.89	824.62	2.4814	.0089**
Net-Total-Assets	1,712,543	512,186	2.5584	.0074**
Panel C: Net-Total-Assets Sample (33 firms)				
Net-Total-Assets	955,896	887,901	1.5757	.0625*
Market Capitalization	2,167.50	1,714.55	0.6442	.2620
Market-to-Book	2.66	2.50	0.2872	.3879

*, ** Statistically significant at 0.10 and 0.05 levels, respectively.

The market-to-book data set is not as well matched with respect to all three criteria, especially market capitalization and net-total-assets. In this case, the ABC firms tend to be larger, which may bias the results shown later in Section four. The net-total-assets data set of 33 firms is reasonably matched against the market capitalization and market-to-book criteria, but the ABC firms have larger net-total assets on average (at .10 level).

The overall result of the matching process is that high-quality matches were achieved for both the market capitalization and net-total-assets data sets. Caution is suggested in regard to the market-to-book data sets due to the less than satisfactory secondary matching results.

Performance Analysis

As Anderson and Young (1999) note, success in ABC implementation is multi-dimensional and one needs to be careful in addressing the question of what constitutes success. In this study, we use a narrow definition of "success" that is consistent with finance theory and the goal of shareholder wealth maximization, namely an increase in shareholders' wealth as measured by stock returns (Haka et al. 1985). As Easton and Jarrell (1998) note, stock returns provide "a comparatively 'clean' overall performance measure." It is important to stress that other measures of performance exist and our results only pertain to the narrowly defined stock market return definition of performance.

For both the ABC firms and their matched counterparts, we compute returns from January 1 in the year of the adoption of ABC. This discrete date was chosen, in the interests of consistency, as the survey information did not identify the month of adoption of ABC. We use both three-year average holding period returns (HPRs) and average cumulative abnormal returns (CARs) to test for difference between each matched set of firms. The HPR measure is used to overcome the findings of Conrad and Kaul (1993) and Barber and Lyon (1997), that CAR-based metrics can lead to biased test statistics in studies of long-term stock performance. The CAR measure (Ritter 1991) is included as a robustness check.

We compute HPRs over the three-year period commencing in the first month of the year of adoption of ABC as follows:

$$HPR_i = \prod_{t=1}^{36}(1 + r_{it})$$

where r_{it} is the raw return on company i in event month t.

In this study, HPRs were calculated for each ABC and non-ABC matched firm, individually. As in Ritter (1991), months are defined as successive 21-trading-day periods. The paired t-test is then used to test for differences between the holding period return of the ABC firms and the holding period returns of their matched non-ABC counterparts.

Finally, we also compute wealth relatives (WR), (Ritter 1991) as:

$$WR = \frac{1+ \text{average HPRs of ABC firms}}{1+ \text{average HPRs of non-ABC firms}}$$

A wealth relative greater than 1 implies that the ABC firms outperformed the portfolio of matched firms and vice versa.

For the CAR method, we proceed as follows. The monthly average abnormal return for stock i in event month t is defined as:

$$ar_{i,t} = r_{i,t} - r_{m,t}$$

where r_{it} is the return on ABC firm i in month t and $r_{m,t}$ is the return on its matched counterpart in the same month. Note that t = 1 is the first month in the calendar year of the adoption of ABC.

The monthly average abnormal return on the ABC portfolio for event month t is the equally weighted cross-sectional arithmetic average of the individual abnormal returns:

$$\overline{AR}_t = \frac{1}{n}\sum_{i=1}^{n} ar_{it}$$

We use the simple t-test to determine whether the monthly AR is different from 0, that is, whether ABC firms on average outperform the non-ABC benchmark firms in month t:

$$t = \frac{\overline{AR}_t \sqrt{n_t}}{sd_t}$$

where n_t is the number of observations in month t, and sd_t is the cross-sectional standard deviation of the abnormal returns for month t.

The cumulative abnormal return (CAR) for firm i is the summation of the average abnormal return from event month q to event month s:

$$CAR_{iqs} = \sum_{t=q}^{s} AR_{it}$$

The CAR is cross-sectionally averaged and the t-statistic for the cumulative average abnormal return from month 1 to month t is computed as (Ritter 1991):

$$t = \overline{CAR}_{1t} \cdot \sqrt{n_t} / csd_t$$

where: $\overline{CAR}_{1t} = \frac{1}{n_t}\sum_{i=1}^{n_t} CAR_{i1t}$,

n_t = the number of firms trading in each month;
$csd_t = (t.var + 2 \cdot (t - 1) \cdot cov)^{1/2}$;
t = the event month;
var = the average (over 36 months) of the monthly cross-sectional variances; and
cov = the first-order autocovariance of the AR_t series.

RESEARCH FINDINGS

Table 5 contrasts the performance of the ABC firms with that of their non-ABC matched counterparts. Results are presented for the HPR and CAR methods, as well as a nonparametric test of the proportion of ABC firms that outperformed their matched counterparts. Using the HPR method, the ABC firms clearly outperform their matched counterparts in the three years commencing with the year of the introduction of ABC. Over this period, the ABC firms average approximately 61 percent return (58.66 percent to 63.24 percent depending on the sample used) in contrast to the approximately 34 percent (30.32 percent to 36.02 percent) earned by their matched counterparts. This 27 percent difference, on average, is statistically significant in all cases (at the 0.05 level).

The CAR method confirms the above results, with the ABC firms outperforming their non-ABC counterparts, by approximately 25 percent, on average, over the three-year period. The nonparametric test of proportions confirms that in most samples, the percentage of ABC firms that outperform their matched counterparts is above 60 percent and is statistically larger than 50 percent at the 0.10 level in four of the six cases. Finally, wealth relatives that range from 1.16 to 1.25 indicate the magnitude of the difference in performance over the three-year period.

Figures 3, 4, and 5 highlight the magnitude of the positive difference in favor of the ABC firms over the 36 months. The largest positive abnormal returns are observed in the last 12 months of the study period in each case. A possible reason for this is the complexity of an ABC system and the lengthy time frame required for full implementation. This may lead to a delay between implementation and the realization of the benefits in the stock price.

ROBUSTNESS TESTS

We provide four additional robustness checks to show that the superior returns earned by the ABC firms are not a result of our matched sample method. First, we compare the performance of the ABC firms with that of the FTSE-100 index, a broad-based market index. Second, we track the performance of the ABC firms and their matched counterparts in the two-year period prior to the adoption of ABC. Third, we provide a comparison between the ABC and the non-ABC firms for a number of accounting-based measures of performance. Finally, we compare the occurrence of other strategic initiatives such as new capital raised, acquisitions, and divestitures for the ABC and the non-ABC firms both before and after the adoption of ABC.

Table 6 compares the post-adoption performance of the ABC firms with the FTSE-100 index. In this case, the HPR for the FTSE-index was computed over the same 36 months as that used to compute each ABC firm's HPR. The results are very similar to those found using the matched-firm approach. In summary, the ABC firms outperform the FTSE index by approximately 20 percent over the three years beginning on January 1 of the year that ABC is first adopted. This difference in performance is statistically significant in all cases, at the 0.05 level. In addition, approximately 60 percent of the ABC firms outperform the FTSE-index over the three-year period and the wealth relative is in the order of 1.14.

Failure to capture risk differences could explain the superior performance of our ABC firms. To address this possibility, we contrast the performance of these firms over a different time period. The period chosen is the two-year period prior to the first year that ABC was adopted by the ABC firms. The results in Table 7 show little difference in performance between the two groups during this two-year period. The difference in abnormal returns is between –7 percent and +5 percent, depending on the sample used, and is never statistically significant at conventional levels.

FIGURE 3
Monthly HPRs of ABC Firms vs. Non-ABC Firms
Market Capitalization Sample

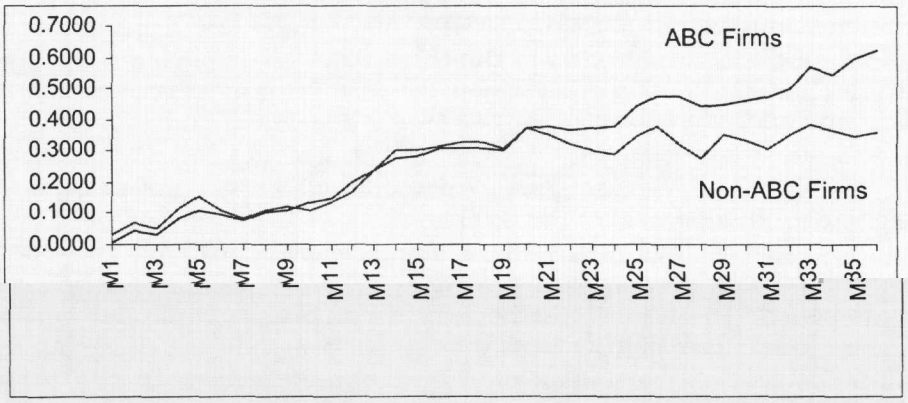


FIGURE 4
Monthly HPRs of ABC Firms vs. Non-ABC Firms
Market-to-Book Sample

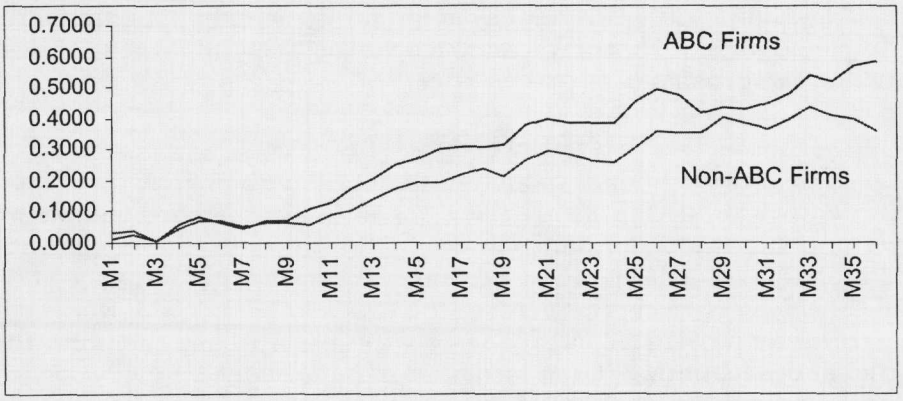


FIGURE 5
Monthly HPRs of ABC Firms vs. Non-ABC Firms
Net-Total-Assets Sample

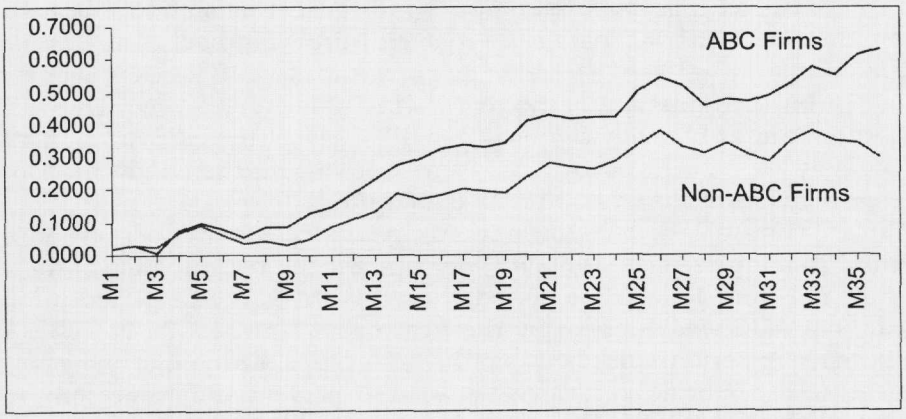


TABLE 5
Three-Year Post-Adoption Performance of ABC Firms vs. Non-ABC Firms

Description	ABC Firms (Mean)	Non-ABC Firms (Mean)	Difference	t-value	Prop. of ABC Firms > Non-ABC Firms	z-value	Wealth Relative
3-Year HPR							
Market Capitalization	62.27%	35.76%	26.51%	1.8241**	.6563	1.7678**	1.20
Market-to-Book	58.66%	36.02%	22.64%	1.7981**	.5455	0.5222	1.17
Net Total Assets	63.24%	30.32%	32.92%	2.0758**	.6429	1.5119*	1.25
3-Year CAR							
Market Capitalization	58.55%	36.50%	22.05%	2.2080**	.6875	2.1213**	1.16
Market-to-Book	58.62%	32.21%	26.41%	2.2548**	.6061	1.2185	1.20
Net Total Assets	56.80%	31.10%	25.70%	2.3129**	.6429	1.5119*	1.20

*, ** Statistically significant at 0.10 and 0.05 levels, respectively, based on a one-tailed test.

TABLE 6
Three-Year Post-Adoption Performance of ABC Firms vs. FTSE-100 Index

Description	ABC Firms (Mean)	FTSE-100 Index (Mean)	Difference	t-value	Prop. of ABC Firms > Non-ABC Firms	z-value	Wealth Relative
3-Year HPR							
Market Capitalization	62.27%	43.61%	18.66%	1.6941**	.5938	1.0607	1.13
Market-to-Book	58.66%	40.46%	18.20%	1.8091**	.6364	1.5667*	1.13
Net Total Assets	63.24%	41.18%	22.06%	1.9213**	.6552	1.8898**	1.16

*, ** Statistically significant at 0.10 and 0.05 levels, respectively, based on a one-tailed test.

The proportion of ABC firms that outperformed their matched counterparts is between 43 percent and 56 percent, again not statistically significant at conventional levels. Finally, the wealth relatives are between 0.94 and 1.04. We believe this similar performance over the two-year pre-event period shows that our results are not purely the result of methodological problems, such as a failure to adequately adjust for risk differences.

Our third robustness check is to determine whether our ABC-adopting firms have superior operating performance in addition to the superior stock return performance we document above. Many recent studies have used accounting-based performance tests to confirm the under- or overperformance found in stock market returns. Barber and Lyon (1996, Table 1) provide a comprehensive list of 11 recent studies using this approach. They also conduct an extensive simulation study to determine the most appropriate statistical procedures for tests of accounting performance. Their three major conclusions are:

(1) due to the presence of extreme observations, nonparametric Wilcoxon test statistics are uniformly more powerful than parametric t-tests, regardless of the operating performance measure used;

(2) test statistics using changes in operating performance relative to a benchmark yield more powerful tests than those based on a firm's relative performance; and

(3) test statistics are only well specified when sample firms are matched to control firms with similar pre-event performance.

Barber and Lyon (1996) also express a preference for a performance measure based on operating income rather than earnings, although they concede that the choice is generally inconsequential from a statistical standpoint.

Consistent with Barber and Lyon (1996), we report medians rather than means in Table 8 and use a Wilcoxon paired test based on changes in accounting performance rather than the relative performance. We also note that our evidence of no difference in the prior period returns of our ABC firms relative to their matched counterparts has added importance in light of Barber and Lyon's (1996) third recommendation (item (3) above). Finally, our major focus is on two measures of accounting performance, return on shareholders equity (earnings-based) and operating profit margin (operating-income-based), although we report several other accounting-based measures in an attempt to determine the drivers of the difference we observe in stock market performance.

A review of the accounting-based measures of performance in Table 8 confirms the superior performance of the ABC firms. In particular, this superior performance is statistically significant for the operating and net profit margins and for the asset turnover ratio in most of the samples we examine (at the .10 level or better). The debt ratio comparison suggests that the ABC firms adopt and sustain a significantly higher leverage profile than the non-ABC firms. Taken together, the accounting ratios suggest that the cost control, asset utilization, and financial management characteristics of the ABC firms all contribute to the superior performance of the ABC firms.

Finally, we searched for evidence of other significant corporate events in the year preceding and the three years following the adoption of ABC for both our ABC firms and their matched counterparts. The motivation for this inquiry was to address concerns that the superior performance of the ABC firms may be due to

TABLE 7
Two-Year Pre-Adoption Performance of ABC Firms vs. Non-ABC Firms

Description	ABC Firms (Mean)	Non-ABC Firms (Mean)	Difference	t-value	Prop. of ABC Firms > Non-ABC Firms	z-value	Wealth Relative
2-Year HPR							
Market Capitalization	35.58%	30.90%	4.68%	0.4693	.4286	–0.8452	1.04
Market-to-Book	29.82%	34.33%	–4.51%	–0.4413	.5556	0.6667	0.97
Net Total Assets	25.58%	33.02%	–7.44%	–0.5118	.5000	0.0000	0.94

TABLE 8
Accounting-Based Measures of Performance

Description	ABC Median	Non-ABC Median	Median Difference	Wilcoxon Test z-value	Wilcoxon Test p-value	Sign Test z-value	Sign Test p-value
Return on Shareholders Equity							
Market Capitalization	15.38%	12.16%	3.22%	–1.0660	.1430	–2.4440	.0075**
Market-to-Book	17.37%	14.03%	3.35%	–.9710	.1660	–1.9500	.0255**
Net Total Assets	17.43%	15.30%	2.13%	–.9830	.1630	–1.1870	.1175
Operating Profit Margin %							
Market Capitalization	9.94%	8.03%	1.91%	–1.5560	.0600*	–.8890	.1870
Market-to-Book	11.99%	8.28%	3.71%	–2.1100	.0175**	–.0830	.2110
Net Total Assets	11.70%	7.68%	4.02%	–1.9220	.0275**	–1.4240	.0770*
Net Profit Margin %							
Market Capitalization	7.09%	4.80%	2.29%	–1.1940	.1165	–1.1110	.1335
Market-to-Book	8.00%	5.02%	2.98%	–2.0970	.0180**	–1.0320	.1510
Net Total Assets	7.55%	4.91%	2.64%	–1.3550	.0875*	–1.5540	.0600*
Turnover/Assets Employed							
Market Capitalization	1.49%	1.69%	–0.20%	–1.8250	.0340**	–1.9010	.0285**
Market-to-Book	1.61%	2.05%	–0.44%	–2.9070	.0020**	–1.8480	.0325**
Net Total Assets	1.62%	1.68%	–0.06%	–.5820	.2800	–.5980	.2750
Debt Ratio %							
Market Capitalization	35.07%	29.99%	5.08%	–3.0670	.0010**	–3.3330	.0005**
Market-to-Book	33.15%	29.52%	3.63%	–2.1430	.0160**	–1.7210	.0425**
Net Total Assets	34.02%	29.78%	4.24%	–2.5330	.0055**	–2.6110	.0045**

*, ** Significant at the 0.10 percent and 0.05 percent levels, respectively.

the Global Access online database provided by Primark. Table 9 tabulates our results for these three important strategic initiatives. It documents both the number of firms engaged in each activity and the dollar value of the activity expressed as a percentage of the firms' market capitalization. There is no evidence of significant differences between the number of our ABC firms and the number of non-ABC firms that are engaged in these three activities, either before or after the adoption of ABC. (Note that the higher number of firms in the post-ABC period is due to the three-year period as compared to the one-year pre-ABC period that we examine.) Similarly when we examine activity as a percentage of each firm's market capitalization, we find no differences between the ABC firms and their matched counterparts, either before or after the introduction of ABC.

We also read the Chairman and Chief Executive's annual report for the majority of our ABC and non-ABC firms. There are several consistent themes in these reports, including regional development, some element of re-organization and staff changes, changes in directors, encouraging trade performance, increased emphasis on marketing and new product development, emphasis on maximizing shareholder value through long-sighted programs of organic growth coupled with carefully chosen acquisitions, etc. We were, however, unable to discern any marked or obvious differences between the ABC and non-ABC firms.

While we have not examined all possible extraneous events that may be the underlying cause of the superior performance we document for our ABC sample, the above analysis indicates very little difference between our ABC firms and their matched counterparts in terms of several important strategic actions. Nevertheless, we cannot rule out the possibility that some unidentified correlated variable is the cause of our results.

Finally, this study asked firms to rate their experience of introducing the ABC techniques. We found that a substantial majority at 77 percent (n = 36) considered the experience to have been successful. This is consistent with Innes and Mitchell (1995) at 69 percent (n = 34) and the 3.9 Likert scale rating (with 5 being very successful) reported by Innes et al. (2000). It is also consistent with a number of studies (for example, Shields 1995; Swenson 1995; Shields and McEwen 1996; Krumwiede 1998; Anderson and Young 1999) that have used key organizational and social variables to measure the success of ABC implementation. Despite the considerable variation in the degree of success reported by these studies, on average, firms experienced moderate levels of success and perceived a financial benefit from the adoption of ABC. Worth noting is the possibility that respondents from ABC-adopting firms may be exhibiting biased discrimination in their judgment.

SUMMARY AND INTERPRETATION

We provide empirical evidence that the adoption of ABC significantly improves a firm's relative performance in terms of both market- and accounting-based measures. The magnitude of this improved market performance is both economically and statistically significant, averaging approximately 27 percent above the matched non-ABC firms over the three years beginning on January 1 of the year in which ABC is first adopted. While large, this 27 percent superior performance is not dissimilar in magnitude to abnormal returns documented in other studies. For example, Ritter (1991) documents three-year underperformance of greater than 27 percent following initial public offerings, Spiess and Affleck-Graves (1995) document greater than 42 percent underperformance by firms following seasoned equity offerings, and Ikenberry et al. (1995) document positive overperformance of greater than 12 percent in the two years following stock repurchases. Further, our evidence shows that the superior stock performance of the ABC firms is not immediate, but took until the second half of the three-year study period to manifest itself.

TABLE 9
Mandatory Disclosures—Market Capitalization Sample of Firms

Description	Number of Firms ABC	Number of Firms Non-ABC	Difference[a] (p-value)	Mean % of MC ABC	Mean % of MC Non-ABC	Difference[b] (p-value)	Median % of MC ABC	Median % of MC Non-ABC	Difference[c] (p-value)
New Capital									
1 Year prior ABC Adoption	27	28	.7860	2.08%	19.78%	.1780	0.20%	0.22%	.2590
3 Years post-ABC Adoption	29	28	.7680	5.69%	6.96%	.6970	1.22%	0.69%	.8080
Acquisitions									
1 Year prior ABC Adoption	10	12	.5710	6.14%	6.57%	.3760	4.15%	3.50%	.2250
3 Years post-ABC Adoption	23	20	.4740	33.71%	16.74%	.7180	4.49%	6.48%	.3820
Divestitures									
1 Year prior ABC Adoption	5	6	.7110	2.28%	2.76%	.6150	1.54%	2.10%	.6550
3 Years post-ABC Adoption	19	16	.4740	13.96%	12.76%	.6850	6.35%	7.81%	.9530

[a] Using z-test for equality of two proportions.
[b] Using t-test for equality of two means.
[c] Using Wilcoxon test for equality of two medians.

Our evidence of superior performance for ABC-adopting firms provides tangential support for two other studies related to the impact and benefits of ABC. First, Malmi (1999) explores four possible reasons for adopting ABC: efficient choice, forced selection, fads, and fashion. Superior subsequent performance suggests that the adopting firms made a rational value-enhancing choice when adopting ABC. Consequently, our results provide support for Malmi's (1999) evidence in favor of the efficient choice hypothesis, although we are unable to determine if this is limited to the early adopters ("take-off" stage) as he suggests. Second, Shields and McEwen (1996) report that 75 percent of responding companies report a financial benefit from implementing ABC. Our evidence of superior stock returns following adoption suggests that the companies' perception of financial benefit is justified.

In contrast to the support for the above studies, our results do not clarify Gosselin's (1997) ABC paradox, but rather accentuate it. If ABC-adopting firms have better stock performance in addition to the other benefits cited in the literature, then why have more firms not implemented the approach? Moreover, why do many firms that adopt ABC stop using it? While none of our survey firms indicated that they had introduced and subsequently abandoned ABC, Ness and Cucuzza (1995) suggest that only 10 percent of firms that adopt ABC continue to use it. This is clearly inconsistent with our value-enhancing evidence and we are unable to shed further light on Gosselin's (1997) paradox.

Third, many factors drive relative stock price performance and the superior performance we document for ABC firms may be a result of another variable that is simply correlated with ABC in our sample. Alternatively, as Shields et al. (2000) suggest, the effects of a system such as ABC may be indirect through the mediating influence of another variable. For example, case study research by Innes and Mitchell (1990b) shows substantial organizational restructuring is required for the introduction of ABC. They suggest that this restructuring, rather than the ABC system *per se*, is the cause of the superior subsequent performance. Similarly, Anderson and Young (1999) show that both contextual factors (individual and organizational) and factors related to the implementation process are associated with ABC project evaluations and outcomes. In a different context, Haka et al. (1985) argue that factors such as resource scarcity and reward structure may confound the relationship between implementation and performance.

Ultimately, no observational study can prove a causal relationship (Easton and Jarrell 1998). However, we have attempted to mitigate the problems by using an established research methodology and a carefully constructed control sample. We also attempt to control for several additional factors in a series of robustness checks. While it is not possible to examine every potential confounding variable, we show that our results hold when firms are matched on market capitalization, market-to-book ratio, or net-total-assets value. We also show that there is no difference in the performance of the ABC and non-ABC firms in the two years prior to the adoption of ABC. We regard this as an important test as it suggests there are no differences in priced risk factors between our sample and the matched firms prior to the adoption of ABC. We also document superior performance by the ABC firms using both market- and accounting-based measures. Finally, both before and after the adoption of ABC, we find no difference in either the frequency or the magnitude of new capital raised, acquisitions, and divestitures between our ABC and non-ABC firms.

In conclusion, Cooper and Kaplan (1992) argue that "the goal of ABC is to increase profits, not to obtain more accurate costs." While the adoption of ABC usually requires considerable organizational support and can be extremely costly, the consistency of our results across matching criteria and other robustness checks, suggests that firms were effective in reaping the net benefits, on average. The overall results are consistent with an inference that the introduction of ABC techniques improves firm performance. Nevertheless, despite this evidence, caution must be exercised in extrapolating the results of this study. In particular, it is not necessarily true that companies that have not implemented ABC can improve performance by simply introducing ABC techniques. While ABC 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. Using our sample and methods, it is very difficult to determine whether the particular management actions that led to the superior performance of our ABC firms is due to the information system or some other related factor. Consequently, the factors that drove our sample firms to implement ABC may not be present in other firms and therefore, the introduction of ABC may not provide similar benefits to new adopting firms.

APPENDIX

Activity-Based Costing (ABC) Techniques Questionnaire ***(Confidential)***

The introduction of Activity-Based Costing (ABC) techniques has met with mixed success. Some firms have had very successful implementations whilst others have adopted and later abandoned the approach. This questionnaire is the basis of a research study aimed at establishing if the introduction of ABC techniques makes a significant difference to firm performance.

ABC is defined by Raffish and Turney (1991) as "a methodology that measures the cost and performance of activities, resources and cost objects." The cumulative cost of each activity is then traced to products or services that make that activity necessary. By so doing ABC recognises the causal relationship of cost drivers to activities.

Please return the completed questionnaire by using the attached prepaid envelope or fax before Friday, March 22 to: RESEARCH CENTRE, HENLEY MANAGEMENT COLLEGE. Fax: 01491-571454

Firm Name: _____ Respondent: _____ (optional)

Position in Organisation: _____

(Please print the above)

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1. Has your firm ever used ABC techniques?

Yes	
No	

If Yes, Answer Questions 2 to 9.

If No, go to Question 10.

2. When were the ABC techniques introduced and what proportion of your firm's Sales Value, Total Assets and Total Costs were affected by their introduction? Show multiple introduction dates and data separately, if appropriate.

WHEN		**PROPORTION AFFECTED**		
Month	**Year**	**% of Sales Value (approx.)**	**% of Total Assets (approx.)**	**% Total Costs (approx.)**

3. Please complete if your firm has used ABC techniques and abandoned them.

WHEN		**PROPORTION AFFECTED**		
Month	**Year**	**% of Sales Value (approx.)**	**% of Total Assets (approx.)**	**% Total Costs (approx.)**

4. Who was involved in the design and implementation of the ABC techniques? (Tick as appropriate)

Description	Design	Implementation
Consultants		
In-house accountants		
Production personnel		
Systems personnel		
Marketing personnel		
Any other (please specify)		

5. For which of the following purposes were the ABC techniques introduced and are they still used for that purpose? (Tick as appropriate)

	Basis of Decision to Introduce		Current Use	
Purpose	**Yes**	**No**	**Yes**	**No**
Stock Valuation				
Product Pricing				
Product Output Decisions				
Cost Management and Reduction				
Cost Budgeting				
New Product Design				
Customer Profitability Analysis				
Performance Measurement				
Cost Modelling				
Any other purpose (please specify)				

6. Have the ABC techniques being used? (Tick as appropriate)

	Yes	No
As a parallel system with another costing system		
As the main costing system		

7. How would you rate the overall success of the introduction of the ABC techniques in your firm? (Tick as appropriate)

Degree of Success

Very successful _____
Fairly successful _____
Neutral _____
Fairly unsuccessful _____
Very unsuccessful _____

8. Did you experience any unexpected outcomes from the introduction of the ABC techniques?

Yes [ ] **No** [ ]

If yes, please state these outcomes:

_____

9. If you wish to add any further comments about the use of the ABC techniques please do so:

_____

_____

10. Into which of the following categories does your firm fall and why? (Ignore if answered Yes to Question 1)

Category	**Yes**	**No**	**Why (optional)**
We have considered using ABC techniques and rejected them.			
We are currently considering using ABC techniques.			
We have not considered ABC techniques.			

Thank you for helping me with this research study.

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