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Does a differentiation strategy lead to more sustainable financial performance than a cost leadership strategy?

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Abstract

Purpose – The purpose of this paper is to investigate the relationship between the strategic positioning of firms and the sustainability of firm performance. The paper argues that pursuing a differentiation strategy leads to more sustainable financial performance compared to following a cost leadership strategy. However, a differentiation strategy may also be associated with greater risk.

Design/methodology/approach – To investigate the research questions, the authors utilize publicly available archival data consisting of 12,849 firm-year observations for the period 1989-2003. In the first stage of the analysis, factor analysis is used to determine firms' strategic positioning. The resulting factor scores are subsequently used in regression analysis to investigate the sustainability of performance based on the strategic positioning of firms.

Findings – The results indicate that both cost leadership and differentiation strategies have a positive impact on contemporaneous performance. However, the differentiation strategy allows a firm to sustain its current performance in the future to a greater extent than a cost leadership strategy. The differentiation strategy, though, is also associated with greater systematic risk and more unstable performance.

Originality/value – Sustainability of performance refers to how much a firm's current profitability can be sustained in future periods. The main contribution of this study is the comparison of generic strategies based on the sustainability of firm performance. This aspect of the strategy-performance link has not been considered in prior work. Another contribution of the study is that it considers multiple dimensions of firm performance in order to evaluate the trade-offs involved with pursuing different strategies. In particular, the authors contribute to the literature by documenting that while differentiation leads to more sustainable earnings, it also leads to riskier and more unstable earnings.

Keywords Sustainability, Differentiation, Firm performance, Strategic positioning, Cost leadership
Paper type Research paper

I. Introduction

Recent work in strategic management examines the characteristics of resources and processes of firms that create competitive advantages that enable sustainable performance. Firms achieve more sustainable financial performance when the resources that drive the process of value creation in the existing operations of a firm continue to create value in future periods. Firms with sustainable performance would be those that

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are less prone to external shocks that affect the creation of value within the firm. An examination of the patterns in firms' allocation of resources may reveal differences in their ability to achieve sustainable performance in the future. Such an examination is the principal objective of our study.

The idea of sustainable competitive advantage is well rooted in the strategy literature. This notion by itself is a dynamic one – only if a firm possesses a competitive advantage that is sustainable, can it continue to maintain superior financial performance over the long run. Whether a firm possesses a sustainable competitive advantage or not requires the examination of financial performance of firms over time. This question cannot be examined by considering contemporaneous performance alone.

Prior literature indicates that a firm following either a differentiation or a cost leadership strategy is in a better position to achieve superior contemporaneous performance (Porter, 1980, 1985; Hambrick, 1983b; and others). These advantages can be sustained, though, only if firms can build effective barriers to the imitation of best practices that enable superior performance in the short run (Ghemawat, 1986). In more recent work, Porter (2001) argues that technological innovations that permit the rapid diffusion of best practices make some operational improvements that enhance cost efficiency easily imitable. On the other hand, benefits derived from a differentiation strategy built on products or services that are perceived to be different from competitors, take longer to imitate and hence would likely lead to more sustainable performance. In this paper, we use archival audited data for a large sample of listed firms to empirically investigate how different business strategies affect the sustainability of firm performance. We examine different aspects of firm performance – earnings, cash-flows, and firm risk.

In doing so, we heed to two calls in the literature. One suggests that the notion of performance is multi-dimensional and should not be restricted to measures such as accounting profit alone (e.g. Barney, 2002). The other call has been to consider the longitudinal analyses of the links of strategy with firm performance (e.g. Allen *et al.*, 2007) rather than focussing on the contemporaneous effects strategy on firm performance. The rest of the paper is organized as follows. In the next section we present our theoretical framework and discuss the relevant literature. This discussion leads to our research hypotheses which are presented in Section 3. In Section 4, we discuss the strategy measures. These strategy measures are used in our empirical model which is presented in Section 5. Section 6 discusses the empirical results from our analysis and Section 7 presents our concluding remarks.

II. Literature review and theoretical framework

Porter (1980) presents a framework describing two generic strategies that a firm can use to achieve competitive advantage: cost leadership and differentiation. Recent research documents that Porter's generic strategy framework is still applicable to competition in the digital age (Kim *et al.*, 2004). Firms adopting the cost leadership strategy aim to increase market share based on creating a low-cost position relative to their peers. Firms can adopt different resource allocation methods to achieve cost leadership: large-scale facilities, process improvements, cost minimization, TQM, benchmarking, and overhead control. On the other hand, firms adopting the differentiation strategy achieve a competitive advantage by investing in developing products or services that offer unique qualities desirable to customers which allow the firm to command a price premium. In this paper, we document that the two generic strategies, differentiation and cost leadership, do not represent two ends of the same

continuum, consistent with the observation of several firms (e.g. Caterpillar, Toyota) successful in the past that have chosen to focus on both differentiation as well as efficiency (Hall, 1980).

Link between generic strategies and performance

Following Porter's early work discussing the generic strategies, many studies were done to examine his premise that firms following both differentiation as well as cost leadership are able to achieve superior contemporaneous performance. Hambrick (1983b), White (1986), and Miller and Dess (1993) utilize the profit impact of marketing strategies database to analyze Porter's theory and find evidence of higher performance, in terms of market share and profits, for firms following both differentiation and cost leadership strategies. Using a field study approach relying on interview with executives, Dess and Davis (1984) also find that adopting both differentiation and cost leadership leads to higher sales growth and ROA. More recent studies (e.g. Hoque, 2004) also find links between strategy type and organizational performance. However, some others were not able to find such a link (e.g. McGee and Thomas, 1986, 1992), or have found that the link is not as strong under some situational variables (Davis and Schul, 1993; Zahra, 1993; Nandakumar *et al.*, 2011). Hence, there are still gaps and contradictions in the strategy research that examines the link between strategy and performance. This calls for further research on the relationship between strategy and performance to advance strategic theory (Allen and Helms, 2006).

While many studies find links between strategy and contemporaneous performance, the fact that a firm has superior performance in a given year does not, by itself, imply that it has a sustainable competitive advantage. As Porter (1985, p. 11) argues "the fundamental basis of above-average performance in the long run is sustainable competitive advantage. Without a sustainable advantage, above-average performance is usually a sign of harvesting." In the words of Ghemawat (1999, p. 98), "We need to […] look at sustainability in the face of imitation. Imitation of the resources underpinning superior performance to the point where they are no longer scarce is a direct threat to the sustainability of added value." A difficulty lies in the inability of firms to restrain competitors from imitating or even improving on existing sources of its advantage. But some barriers will be higher than others and hence more difficult for rivals to overcome. Systematic methods for obtaining information are generally available to all competitors and new techniques diffuse rapidly (Barney, 1986). A competitive advantage is sustained only if it continues to exist despite efforts to duplicate that advantage (Ghemawat, 1995). Even so, some firms are able to generate superior performance over long time frames (e.g. Wiggins and Ruefli, 2002). The key question then that remains unanswered is – what strategic positioning leads to sustained performance over time? In this study we attempt to answer this question by examining an aspect of firm performance that has not been considered in the prior literature looking at the strategy-performance link, which is, the persistence or sustainability of superior performance over time.

III. Research hypotheses

Cost leadership and sustainability of performance

A cost leadership strategy is usually built on the basis of achieving operational efficiency. To the extent the sources of operational efficiency can be copied (D'Aveni, 1994) or rendered inoperable due to advent of newer and better sources (Hamel, 2000) the competitive advantage through adopting such strategies is temporary, and long-term sustained profitability is not feasible (Eisenhardt and Martin, 2000).

As Barney (2002, p. 251) explains: "[…] if cost-leadership strategies can be implemented by numerous firms in an industry, or if no firms face a cost disadvantage in imitating a cost-leadership strategy, then being a cost leader does not generate a sustained competitive advantage for a firm." Continuous improvement in operational efficiency at a pace faster than competitors is necessary to sustain superior profitability over time. The rapid diffusion of best practices, though, allows competitors to quickly imitate management techniques and practices. To the extent that a strategy is built on such generic solutions related to operational efficiency, we expect that such a strategy would be more susceptible to imitation by competitors and peers, implying that the comparative cost advantages would dissipate over time. Achieving cost efficiency through process improvements and technological hardware is not likely to yield an inimitable source of competitive advantage, especially if it is developed by suppliers and sold on the open market (Barney, 2002). Being first with a new process only provides a firm with a temporary cost advantage because imitation is inevitable (Murray, 1988). This notion is corroborated in recent work that compares the role of proprietary technologies vs cost leadership in giving early entrants a durable advantage. Coeurderoy and Durand (2004) look at this issue and find that proprietary technologies allow early movers significant and persistent advantages over competitors. On the other hand, cost leadership does not benefit first movers with any durable advantage.

Another documented source of cost advantage is through economies and diseconomies of scale. As Barney (2002, p. 253) argues "[…] these sources of cost advantage do not build on history, uncertainty, or socially complex resources and capabilities and thus are not protected from duplication for these reasons." An additional source of competitive advantage following cost efficiency is capitalizing on learning or experience effects. On the one hand, the knowledge-based view of the firm suggests that organization learning developed within a firm can represent critical resources that can be leveraged to create sustainable advantages (Grant, 1996). However, studies have generally found that entry barriers are typically quite low despite the existence of steep learning curves (Zimmerman, 1982; Murray, 1988). This is because information diffuses across firms and such knowledge spillovers prevent firms from maintaining any cost advantages over their competitors (Lieberman, 1982). A classic example of this is provided by Abernathy and Wayne (1974). They point out that firms that utilize a cost leadership strategy based on the learning curve face the challenge of taking their eyes off the innovative changes needed to respond to changes introduced by competitors. They cite the case of Ford Motor Company which single-mindedly focussed on the production of the Model T to achieve the lowest costs possible. This made the organization inflexible and vulnerable to the strategy of product innovation initiated at General Motors.

Differentiation and sustainability of performance

In contrast, advantages attained through differentiation are more likely to be sustainable because unique services or products valued by customers cannot be easily imitated by competitors (Grant, 1991). A strategy of differentiation is usually developed around firm-specific and product-specific innovations and marketing effort that may not be easy to imitate quickly. For instance, responses by competitors to pricing moves come almost immediately, while responses to innovation through R&D would take a much longer period. R&D allows a firm to build technological capabilities which are viewable as one of the most important sources of sustainable competitive

advantage (Coombs and Bierly, 2006). The longer it takes for a competitor to respond to a particular comparative advantage, the greater the opportunity for a firm to capitalize on the sustained advantages and to create new ones.

Moreover, a focus on making reliable and high quality products will have a significant impact on sales, especially in more mature industries or in industries in which there is a high cost of poor performance (Porter, 1985). Firms that focus on differentiation often rely on product customization which, in turn, involves depending on close relationships developed with those customers. These close relationships over time build the "reputation" of the firm. A good reputation translates into better performance (Black *et al.*, 2000; Graham and Bansal, 2007) and creates a valuable resource that is difficult to imitate thus providing the firm with a durable advantage (Carter and Ruefli, 2006). Product customization also involves the willingness of the firm to part with proprietary knowledge with suppliers. The sharing of such knowledge leads to more durable relationships since the firms need to rely on each other. The complex relationships that firms focussing on differentiation build with their customers and suppliers will be costly to duplicate and hence become a source of sustained competitive advantage.

Firms focussing on differentiation, in many cases emphasize the level of service and support. While a basic level of service and support may be easy to imitate, increasing these levels beyond the basic level involve substantial amounts of training. Also, this reflects in the attitude of employees toward customers which becomes entrenched in the organization culture and can be hard to duplicate. Companies that excel in developing close relationships with customers build customer loyalty for the long term (Treacy and Wiersema, 1993). This is turn enables such companies to achieve sustainable financial performance in the long run (Heskett and Schlesinger, 1994).

Firms following a cost leadership strategy stress operational efficiency through process improvements and new technology, economies of scale, and experience effects. Kim *et al.* (2004) consider these issues in the context of e-business firms. They argue that firms pursuing a strategy of cost leadership could easily become locked in a vicious cycle of price-cutting because internet technologies tend to be based on cost structures with low variable costs and high fixed costs. However, each of these advantages, is likely to be temporary and not durable. On the other hand, a strategy based on differentiation via product R&D, reputation and brand-building, and strong supplier and customer networks, will provide firms with a more durable advantages enabling sustainable performance over time.

Accordingly, we state our first research hypothesis as follows:

H1. Firms pursuing a differentiation strategy are more likely to sustain their performance over time than firms pursuing a cost leadership strategy.

An obvious question that would arise then is why do not all firms follow a differentiation strategy if it leads to more sustainable performance? We next investigate a potential trade-off involved in following a differentiation strategy by examining another dimension of firm performance, namely, firm risk. Baird (1984) and Miller and Dess (1993) advocate "stability" in firm performance as a measure of predictability of performance or lower risk for firms that seek to have not only high returns but steady sources of returns. Stakeholders of firms including shareholders, creditors, and suppliers have a general preference for firms that have more stable and predictable earnings. Firms with more volatile profit streams are considered to be

riskier. Firms that have strategies built on differentiated products or services typically invest in firm-specific intangible assets such as R&D projects, technology alliances, brand names, and patents which are highly idiosyncratic with great uncertainty in value and greater non-tradability (Lev, 2001; Gu and Wang, 2005). For example, pharmaceutical and biotechnology firms that make investments in developing new drugs face a high degree of uncertainty regarding the eventual earnings outcome of these investments. Studies have shown that for biotech R&D projects, the ultimate success rate from phase I clinical trials to final approval by the Food and Drug Administration in the USA is only in the region of 22.5 percent (Xu *et al.*, 2010). As a result, Scherer *et al.* (1998) find that the reward to the innovation process is highly skewed, as success is concentrated in a few firms or products. On the other hand, firms that follow a cost leadership strategy are more likely to make investments in capital expenditures in order to achieve economies of scale. It is well documented that firms that invest in expenditures related to innovation such as R&D tend to have higher earnings variability relative to investments in more traditional capital expenditures (Kothari *et al.*, 2002). Hence, we argue that firms following a differentiation strategy may have more volatile earnings since the outcomes associated with innovative projects may be impacted more by the uncertainty associated with economy swings. Similarly firms that invest heavily in product and marketing aspects, tend to invest heavily in new products. However, 80 percent of all new products are doomed for failure (Crawford, 1977). Hence, investments made in marketing and new product design are also risky.

On the other hand, firms following a cost leadership strategy are likely to make significant investments in fixed assets in order to achieve economies of scale. This increases the operating leverage of such firms making profits more sensitive to any changes in the level of sales. Thus, profits for these firms are likely to be more volatile. If so, we may not find that a differentiation strategy is associated with greater risk than a cost leadership strategy.

We examine this question in our second research hypothesis which can be stated as follows:

H2. The earnings of firms pursuing a differentiation strategy are more likely to be riskier than the earnings of firms following a cost leadership strategy.

IV. Strategy measures

Mintzberg (1987) distinguishes between intended strategy and realized strategy. Intended strategy is the traditional view of strategy as a statement of intent, while realized strategy views strategy as a pattern in a stream of decisions followed by actions. Realized strategies emerge through events and environment interactions as they unfold over time, evolving in a slow and gradual process. Strategic choices are manifested in firms' resource allocation decisions which, in turn, impact the numbers reported in financial statements. Therefore, we may be able to infer a firm's strategy from its reported financial data. While the use of perceptual measures captured through surveys in many prior studies is consistent with measuring intended strategy, we rely on an operationalization based on archival audited data to measure the realized strategies of firms. This addresses the concerns of perceptual biases that have been documented in the strategy literature (e.g. Reger and Huff, 1993; David *et al.*, 2002).

Porter (1980, 1985) posited that a firm may obtain a competitive advantage by creating a higher value for its customers than the cost of creating it, either by adopting

a differentiation strategy or an efficiency strategy. A firm can differentiate itself by offering high quality and innovative products with superior design or brand image, technology or customer service, a strategy typically implemented by making investments in costly activities such as extensive research, product design, and marketing. These expenditures in turn enable the firm to earn price premiums relative to its competitors.

Hambrick (1983b) argues that the main dimension of the cost leadership strategy is efficiency, the degree to which inputs per unit of output are low. To the extent that firms following a cost leadership strategy succeed in deploying the minimum amount of operating costs and assets needed to achieve the desired sales, they would be able to improve their financial performance (Hambrick, 1983b; Porter, 1980). Such firms pay great attention to asset use, employee productivity, and discretionary overhead. Their customers buy their products primarily because they are priced below their competitors' equivalent products, an advantage achieved through minimizing costs and assets per unit of output (Hambrick, 1983b). We utilize six variables to measure strategic positioning. These variables are identical to those used by Balsam *et al.* (2011) to measure strategy. We use exploratory factor analysis with these variables to identify the common factors that explain the variation in these variables. We describe the six variables below:

SG&A/SALES is the ratio of the selling, general and administrative expenses to net sales. This variable captures a firm's investment in activities required to differentiate its product or service offering from its competitors (Berman *et al.*, 1999; David *et al.*, 2002; Miller and Dess, 1993; Thomas *et al.*, 1991). Firms pursuing a differentiation strategy will invest in a variety of activities such as advertising, promotions, customer service, product distribution, and other related activities in order to differentiate themselves from competitors. A higher allocation of resources to SG&A indicates an effort to build and strengthen the firm's brand and product image. Higher allocation to SG&A also reflects greater effort in achieving better coordination amongst activities within the firm (Wiggins and Ruefli, 2002). This is also indicative of a differentiation focus for the firm**.** For these reasons, higher SG&A indicates a greater likelihood that the firm is pursuing a differentiation strategy.

R&D/SALES is the ratio of the research and development expenses to net sales. Key to the success of firms pursuing differentiation is the ability to offer high quality and innovative products and services. This variable captures a firm's propensity to spend on research and product design[1]. Higher R&D expenditure is likely to indicate that a firm is pursuing a differentiation strategy (Hambrick, 1983b; David *et al.*, 2002; Thomas *et al.*, 1991).

SALES/COGS is the ratio of net sales to cost of goods sold. A firm pursuing a differentiation strategy is likely to create a unique perception of its products and services superior to its competitors, enabling it to command above-market prices, and greater profitability (Porter, 1980). Therefore, a higher margin as measured by SALES/COGS is likely to be associated with a differentiation strategy (Kotha and Nair, 1995; Nair and Filer, 2003). Some researchers have used the margin variable to measure cost efficiency (e.g. Hambrick, 1983b; Berman *et al.*, 1999), since a firm pursuing an efficiency strategy will aim to minimize its cost of goods sold relative to sales in order to improve gross margin. Hence, we conduct an exploratory factor analysis to examine whether this variable loads along factors for differentiation or cost leadership.

SALES/CAPEX is the ratio of net sales to capital expenditures on property, plant, and equipment. Firms that follow a cost leadership strategy are more likely to focus on

developing processes that maximize operational efficiency (Berman *et al.*, 1999; Hambrick, 1983b; Kotha and Nair, 1995; Miller and Dess, 1993). Hence, they will be able to achieve higher sales revenue for every dollar invested in property, plant, and equipment. SALES/P&E is the ratio of net sales to net book value of plant and equipment. The net book value of plant and equipment represents the total stock of plant and equipment net of depreciation. Similar to the SALES/CAPEX measure, a higher value for this ratio also indicates a more efficient use of the firm's assets. An alternate measure that has been used in the literature to capture the productive use of assets is the ratio of number of employees to total assets, which we refer to as EMPL/ASSETS (Hambrick, 1983b; Kotha and Nair, 1995; Nair and Filer, 2003). In this ratio the number of employees is used in the numerator as an alternative proxy for size (output) instead of net sales. The total assets used in achieving this size are considered an input in the production process. Hence, this measure captures the ratio of outputs to inputs, i.e. the productivity of the firm. All three measures capture a firm's efficiency in utilizing its capital investments, also referred to as asset parsimony (David *et al.*, 2002).

We obtain data for the strategy variables from the Standard & Poors Compustat database which collects financial, statistical and market information on active and inactive companies. We utilize data from the sample period 1989-1998 to construct our strategy variables. We compute the mean of the previous five years of data for each of the above six variables on a rolling basis to capture the long-term strategic orientation of firms. For example, the SG&A/SALES variable for firm i in year 1995 is the mean SG&A/SALES for firm i during the years 1990-1994. Similarly, in 1996 we utilize the mean SG&A/SALES during years 1991-1995, and so on. We first conduct an exploratory factor analysis to capture the common patterns among the six variables. The results of the factor analysis implemented using these six variables are tabulated in panel A of Table I. The variables load on two factors with eigen values >1. The SG&A/SALES, R&D/SALES, and SALES/COGS variables load together on one factor which we label as "Differentiation." It is noteworthy that the SALES/COGS variable loads primarily on the differentiation factor (factor loading = 0.87) with only a minor loading on the Cost Leadership factor (factor loading = 0.23). The other three variables, SALES/CAPEX, SALES/P&E, and EMPL/ASSETS load together on a second factor which we label as "CostLeadership". Internal consistency of the two factors is determined by computing the Cronbach α's for each set of three variables. Both the coefficients are greater than the recommended cut-offs of 0.70 (Nunnally, 1978). We compute factor scores for each individual firm-year observation based on the factor loadings for each variable, and use the standardized factor scores as our measures of strategy, namely, $Differentiation_t$ and $CostLeadership_t$. The correlation of the strategy variables with their lagged values (up to five lags) ranges from 0.96 to 0.99 for $Differentiation_t$, and 0.93 to 0.99 for $CostLeadership_t$. This is consistent with the notion that these variables evolve through a slow and gradual process.

Next we conduct a confirmatory factor analysis (CFA) to validate the Differentiation and CostLeadership measures. The results of this analysis are presented in panel B of Table I. The model fit statistics suggest that the measurement model provides a good fit to the data. We find the goodness of fit index to be above the suggested cut-offs of 0.9, while the adjusted goodness of fit index is above the recommended cut-off of 0.80 (Joreskog and Sorbom, 1989). The comparative fit index (Bentler, 1989) and the non-normed index (Bentler and Bonett, 1980) are also in the acceptable range. All the factor loadings are large and significant based on the t-statistics ($p<0.001$). The composite reliability and average variance extracted for both constructs meet Fornell and

Panel A: exploratory factor analysis (sample period: 1989-1998)

Variables	*Cost leadership factor loading*	*Differentiation factor loading*	*Final communality*
SG&A/SALES	−0.19	*0.89*	0.829
R&D/SALES	−0.04	*0.77*	0.590
SALES/COGS	0.23	*0.87*	0.810
SALES/CAPEX	*0.88*	0.03	0.775
SALES/P&E	*0.91*	−0.11	0.847
EMPL/ASSETS	*0.68*	0.04	0.458
Variance explained	*2.16*	*2.15*	
Cronbach's α	*0.77*	*0.80*	

Panel B: confirmatory factor analysis (sample period: 1989-1998)

	Cost leadership factor loading (t-value)	*Differentiation factor loading (t-value)*	*Composite reliability*	*Average variance extracted (AVE)*
SALES/CAPEX	0.87 (110.10)		0.84	0.65
SALES/P&E	0.92 (118.60)			
EMPL/ASSETS	0.59 (71.16)			
SG&A/SALES		0.83 (96.08)	0.80	0.57
R&D/SALES		0.68 (78.41)		
SALES/COGS		0.74 (85.89)		

Model fit statistics

Goodness of fit index	0.9383
Goodness of fit index adjusted for degrees of freedom	0.8381
Bentler's comparative fit index	0.9167
Bentler & Bonett's non-normed index	0.8437

Notes: SG&A/SALES, average of SG&A/sales from $t-1$ to $t-5$; R&D/SALES, average of R&D expenditure/sales from $t-1$ to $t-5$; SALES/COGS, average of sales/cost of goods sold from $t-1$ to $t-5$; SALES/CAPEX, average of sales/capital expenditure/from $t-1$ to $t-5$; SALES/P&E, average of sales/net property, plant & equipment from $t-1$ to $t-5$; EMPL/ASSETS, average of number of employees/total assets from $t-1$ to $t-5$

Table I.
Exploratory and confirmatory factor analysis

Larcker's (1981) recommended thresholds. Overall, the results of the CFA suggest acceptable validity and reliability for the strategy constructs used in our analyses.

V. Empirical model

We utilize a variety of techniques for measuring firm performance. We begin our analysis by considering an accounting-based measure, which is the most widespread method of measuring firm's performance. Since accounting-based measures can be affected by discretionary accounting choices, though, we also corroborate our results using a cash-flow based measure of performance. We also consider another aspect of performance, namely, the riskiness of a firm.

We begin by developing an empirical model to evaluate our research hypothesis on the sustainability of performance based on the strategies pursued by firms. We use return on assets (ROA), the earnings before extraordinary items divided by the average total assets, as the measure of a firm's performance[2]. Various studies have used ROA as a measure of performance of a firm (e.g. Wright *et al.*, 1995; Bettis, 1981; Waddock and Graves, 1997). Achieving a high ROA is an objective of most corporations (Hambrick, 1983a; Berman *et al.*, 1999) and is widely relied upon by managers and analysts (Bettis, 1981).

To evaluate our research hypotheses regarding the sustainability of future performance we need to examine whether the extent to which current performance persists into the future depends on the two strategies. To empirically examine this notion of "sustainability" we estimate the following set of equations which includes future ROA, the dependent variable, for each of the five subsequent years as a function of a firm's current performance:

$$ROA_{i,t+j} = \alpha_{0j} + \alpha_{1j} ROA_{i,t} + \varepsilon_{i,t} \; j = 1,2,3,4,5 \tag{1}$$

where $ROA_{i,t+j}$ for $j = 1,2,3,4,5$ refers to the ROA of firm i in periods $t+1$, $t+2$, $t+3$, $t+4$, and $t+5$, respectively. In Equation (1) the coefficient α_{1j} is the measure of the sustainability or persistence of ROA, that is, a measure of the extent to which current ROA persists in future periods. In *H1*, we aim to examine to what extent sustainability as measured empirically by α_{1j} depends on the strategic positioning of the firm, i.e. Differentiaton vs Cost Leadership. Hence, we can express α_{1j} as a function of differentiation and cost leadership as follows:

$$\alpha_{1j} = \beta_0 + \beta_{0j} Differentiation_{i,t} + \beta_{2j} CostLeadership_{i,t} \tag{1a}$$

where $Differentiation_{i,t}$ and $CostLeadership_{i,t}$ refer to the strategies followed by firm i in period t as determined by individual factor scores described in the previous section. Note that the strategy variables are created using data from years $t-1$ through $t-5$. Now we can rewrite Equation (1) substituting the value of α_{1j} as follows:

$$\begin{aligned} ROA_{t+j} = {} & \gamma_{0j} + \gamma_{1j} ROA_{i,t} + \gamma_{2j} ROA_{i,t} \times Differentiation_{i,t} \\ & + \gamma_{3j} ROA_{i,t} \times CostLeadership_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{2}$$

We include the following control variables in our empirical estimation: $Size_{i,t}$, the firm sales divided by total industry sales; $LEV_{i,t}$, the firm leverage measured by the amount of total long-term debt divided by total equity adjusted for stock splits; $BM_{i,t}$, the book-to-market ratio at the beginning of the fiscal year; and $AGE_{i,t}$, the firm age in number of years. We also include industry dummies to control for industry-specific effects. Adding these control variables we can rewrite Equation (2) as:

$$\begin{aligned} ROA_{t+j} = {} & \gamma_{0j} + \gamma_{1j} ROA_{i,t} + \gamma_{2j} ROA_{i,t} \times Differentiation_{i,t} \\ & + \gamma_{3j} ROA_{i,t} \times CostLeadership_{i,t} + \gamma_{4j} Size_{i,t} + \gamma_{5j} LEV_{i,t} \\ & + \gamma_{6j} BM_{i,t} + \gamma_{6j} AGE_{i,t} + \text{industry dummies} + \varepsilon_{i,t} \end{aligned} \tag{2a}$$

The coefficient α_{1j} on $ROA_{i,t}$ in Equation (1) reflects the persistence of earnings from period t to period $t+j$. Since the average value of the $Differentiation_{it}$ and $CostLeadership_{it}$ scales is zero, the coefficients γ_{2j} and γ_{3j} on the terms involving the strategy variables in Equation (2a), therefore, measure the ability of firms to sustain current performance into the future over and above what is achieved by an average firm on each strategy dimension. Based on *H1*, we expect the coefficient γ_{2j} on $ROA_{i,t} \times Differentiation_{i,t}$ to remain positive and significant into the future. We also expect this coefficient to be greater than the coefficient γ_{3j} on $ROA_{i,t} \times CostLeadership_{i,t}$. This would imply that differentiation has a positive impact on sustaining current performance into the future to a greater extent than CostLeadership.

VI. Empirical results

Data

We obtain data for the strategy and financial performance variables used in our study from the Standard & Poors Compustat database. Our control variables, namely, size, book-to-market, leverage, and firm age are also obtained from the Compustat database. Stock price data is obtained from the Center for Research in Security Prices (CRSP) database which is located at the University of Chicago. The CRSP database includes stock price and other derived information for common stocks traded on US exchanges (NYSE, AMEX, and NASDAQ). We exclude financial firms and utility firms from our sample since the more regulated environment in which they operate may mask performance differences across firms and is likely to render strategic positioning of less importance. Our final sample consists of 12,849 firm-year observations for the period 1989-2003. Table II reports the descriptive statistics for the variables used in our empirical model and Table III tabulates the correlations between these variables. The correlation analysis gives us some insights into the relationships between our variables of interest. Both $Differentiation_{it}$ and $CostLeadership_{it}$ have positive correlations with ROA_{it} (Pearson correlation = 0.249 and 0.052, respectively), ROA_{it+1} (Pearson correlation = 0.123 and 0.038, respectively), ROA_{it+2} (Pearson correlation = 0.035 and 0.009, respectively), ROA_{it+3} (Pearson correlation = 0.030 and 0.003, respectively), ROA_{it+4} (Pearson correlation = 0.018 and 0.002, respectively), and ROA_{it+5} (Pearson correlation = 0.022 and −0.000, respectively) but the correlations are higher in the case of differentiation.

Sustainability of performance

To examine the sustainability of the differentiation and the cost leadership strategies, we estimate the models described in Equation (2a) using ordinary least squares. We adjust the standard errors to correct for serial correlation of residuals for the same firm by clustering standard errors by firm. This is based on recommendations for

	n	Mean	STD	Q1	Median	Q3
$Differentiation_{i,t}$	12,849	0	1	−0.670	−0.284	0.366
$CostLeadership_{i,t}$	12,849	0	1	−0.127	0.291	0.529
$ROA_{i,t}$	12,849	0.073	0.053	0.035	0.063	0.097
$ROA_{i,t+1}$	12,015	0.058	0.073	0.026	0.058	0.093
$ROA_{i,t+2}$	11,284	0.050	0.273	0.022	0.056	0.091
$ROA_{i,t+3}$	10,562	0.047	0.283	0.020	0.054	0.088
$ROA_{i,t+4}$	9,857	0.044	0.292	0.019	0.052	0.087
$ROA_{i,t+5}$	9,183	0.044	0.301	0.018	0.052	0.086
$Size_{i,t}$	12,849	0.005	0.013	0.000	0.001	0.003
$LEV_{i,t}$	12,753	0.317	0.512	0.024	0.150	0.389
$BM_{i,t}$	12,849	1.017	1.069	0.448	0.738	1.191
$AGE_{i,t}$	12,667	21.852	15.624	10.000	19.000	27.000

Notes: $Differentiation_{i,t}$ is the factor score for the differentiation strategy of firm i in year t. $CostLeadership_{i,t}$ is the factor score for the cost leadership strategy of firm i in year t. $ROA_{i,t}$ is earnings before extraordinary items in year t divided by the average total assets. $Size_{i,t}$ is total sales of firm i divided by total sales of industry (using Fama-French 12-industry definitions). $LEV_{i,t}$ is total long-term debt divided by total equity adjusted for stock splits. $BM_{i,t}$ is the book-to-market ratio at the beginning of the fiscal year. $AGE_{i,t}$ is the age of firm i in year t

Table II.
Descriptive statistics
sample period: 1989-1998

Table III. Correlation analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Differentiation$_{i,t}$ (1)	1.000	0.001	0.249***	0.123***	0.035***	0.030***	0.018*	0.022**	0.043***	−0.221***	−0.059***	−0.088***
CostLeadership$_{i,t}$ (2)	0.008	1.000	0.052***	0.038***	0.009	0.003	0.002	−0.000	−0.077***	−0.118***	0.034***	−0.004
$ROA_{i,t}$ (3)	0.210***	0.012	1.000	0.603***	0.126***	0.095***	0.072***	0.061***	−0.013	−0.381***	−0.211***	−0.033***
$ROA_{i,t+1}$ (4)	0.171*	0.017*	0.679***	1.000	0.167***	0.109***	0.092***	0.074***	0.025***	−0.265***	−0.100***	0.040***
$ROA_{i,t+2}$ (5)	0.171*	0.018*	0.530***	0.687***	1.000	0.037***	0.029***	0.031***	0.015	−0.095***	−0.055***	−0.008
$ROA_{i,t+3}$ (6)	0.159***	0.010	0.428***	0.518***	0.667***	1.000	0.033***	0.026**	0.018*	−0.068***	−0.010	−0.005
$ROA_{i,t+4}$ (7)	0.145***	0.007	0.362***	0.432***	0.510***	0.659***	1.000	0.030***	0.020**	−0.069***	0.003	−0.003
$ROA_{i,t+5}$ (8)	0.152***	0.006	0.322***	0.374***	0.425***	0.505***	0.669***	1.000	0.023**	−0.069***	0.009	−0.005
$Size_{i,t}$ (9)	−0.094***	−0.186***	0.001	0.022**	0.032***	0.044***	0.066***	0.077***	1.000	−0.022**	0.043***	0.372***
$LEV_{i,t}$ (10)	−0.345***	−0.103***	−0.574***	−0.481***	−0.403***	−0.336***	−0.280***	−0.259***	0.174***	1.000	0.120***	−0.000
$BM_{i,t}$ (11)	−0.115***	0.097***	−0.331***	−0.220***	−0.111***	−0.034***	0.011	0.041***	−0.082***	0.199***	1.000	0.025***
$AGE_{i,t}$ (12)	−0.063***	0.021**	−0.033***	0.015	0.041***	0.046***	0.049***	0.048***	0.362***	0.082***	0.050***	1.000

Notes: Top right of the table shows the Pearson correlation and bottom left of the table shows the Spearman correlations. Variable definitions as in Table II. ***,**,*Significance at the 1, 5 and 10 percent levels, respectively

panel data regressions provided in Petersen (2009). We include year dummies to control for possible time effects. We also include industry dummies to control for industry specific effects not captured by other explanatory variables. Industries are classified based on the Fama-French 12-industry classification (Fama and French, 1997). When estimating the models, we remove influential observations with studentized residuals greater than three or Cook's *D* statistic greater than one (Belsley *et al.*, 1980). We use the White's (1980) test and find that we do not have a problem of heteroskedasticiy in our estimations. We also apply the Belsley *et al.* (1980) diagnostics to check for multicollinearity. All the condition indices are less than three, well below the suggested cut-off of 30.

We first estimate the following model to examine the contemporaneous relation between the strategies followed by firms and the performance of firms:

$$\begin{aligned} ROA_{i,t} = {} & \alpha_0 + \alpha_1 Differentiation_{i,t} + \alpha_2 CostLeadership_{i,t} \\ & + \alpha_3 Size_{i,t} + \alpha_4 LEV_{i,t} + \alpha_5 BM_{i,t} + \alpha_5 AGE_{i,t} \\ & + \text{industry dummies} + \varepsilon_{i,t} \end{aligned} \tag{3}$$

where $ROA_{i,t}$ is the ROA of firm i in year t. These results of estimating Equation (3) are presented in Table IV. The coefficient for the differentiation strategy variable is 0.0151 (t-statistic = 9.96) while the coefficient for the cost leadership variable is 0.0016 (t-statistic = 1.96). Consistent with prior literature, we find that while both strategies have a positive impact on contemporaneous performance. That is, both differentiation and cost leadership enable firms to achieve superior performance, compared to firms that focus on neither differentiation nor cost leadership. This is consistent with Porter's original work wherein he espouses that both differentiation and cost leadership enable firms to perform better than their rivals. However, this specification does not allow an examination of whether this advantage gained in the period t can be sustained in the future.

We next estimate Equation (2a) to examine the sustainability of performance based on the strategies. In Table V we report the estimated coefficients for the effect of the

Variables	Predicted sign	Estimated coefficient (t-stat)
$ROA_{i,t} = \alpha_0 + \alpha_1 Differentiation_{i,t} + \alpha_2 CostLeadership_{i,t} + controls + \varepsilon_{i,t}$		
Intercept		0.0986*** (39.99)
$Differentiation_{i,t}$	+	0.0151*** (9.96)
$CostLeadership_{i,t}$	+	0.0016** (1.96)
$Size_{i,t}$		−0.0810 (−1.12)
$LEV_{i,t}$		−0.0355*** (−12.61)
$BM_{i,t}$		−0.0075*** (−8.83)
$AGE_{i,t}$		−0.0001 (−1.09)
Year dummies		Yes
Industry dummies		Yes
R^2		0.27
Number of observations		11,539

Table IV.
Strategic positioning and contemporaneous performance

Notes: Numbers in parentheses are t-statistics based on robust firm-clustered standard errors (Petersen, 2009). Variable definitions are provided in Table II. Year dummies and industry dummies are included in the estimation. For the sake of brevity, the coefficients for these dummies are not reported. ***,**,*Significance at the 1, 5 and 10 percent levels, respectively

Table V.
Sustainability of performance

Independent variables	Pred. sign	Estimated coefficient (*t*-stat) $ROA_{i,t+1}$	Estimated coefficient (*t*-stat) $ROA_{i,t+2}$	Estimated coefficient (*t*-stat) $ROA_{i,t+3}$	Estimated coefficient (*t*-stat) $ROA_{i,t+4}$	Estimated coefficient (*t*-stat) $ROA_{i,t+5}$
$ROA_{t+j} = \gamma_{0j} + \gamma_{1j}ROA_{i,t} + \gamma_{2j}ROA_{i,t} \times Differentiation_{i,t} + \gamma_{3j}ROA_{i,t} \times CostLeadership_{i,t} + \gamma_{4j}Size_{i,t} + \gamma_{5j}LEV_{i,t} + \gamma_{6j}BM_{i,t} + \gamma_{7j}AGE_{i,t} + \varepsilon_{i,t}$						
Intercept		0.0015 (0.73)	0.0043 (1.38)	−0.0084** (−2.44)	−0.0013 (−0.36)	0.0048 (1.24)
$ROA_{i,t}$	+	0.8175*** (58.27)	0.6614*** (32.10)	0.5427*** (22.27)	0.4556*** (17.63)	0.4037*** (15.24)
$ROA_{i,t} \times Differentiation_{i,t}$	+	0.0193*** (3.33)	0.0358*** (4.06)	0.0429*** (3.96)	0.0332*** (2.64)	0.0410*** (3.21)
$ROA_{i,t} \times CostLeadership_{i,t}$	+	0.0189*** (2.69)	0.0147 (1.34)	0.0044 (0.34)	0.0003 (0.02)	0.0041 (0.27)
$Size_{i,t}$		0.0344 (1.21)	0.0508 (1.18)	0.0571 (1.11)	0.0882 (1.42)	0.1217* (1.83)
$LEV_{i,t}$		−0.0078*** (−7.09)	−0.0081*** (−5.89)	−0.0091*** (−5.62)	−0.0093*** (−5.28)	−0.0090*** (−4.86)
$BM_{i,t}$		0.0020*** (5.92)	0.0050*** (8.87)	0.0069*** (10.17)	0.0075*** (9.89)	0.0079*** (9.72)
$AGE_{i,t}$		0.0001*** (3.97)	0.0002***(4.92)	0.0002*** (3.49)	0.0002*** (2.64)	0.0002*** (2.82)
Year dummies		Yes	Yes	Yes	Yes	Yes
Industry dummies		Yes	Yes	Yes	Yes	Yes
R^2		0.55	0.34	0.24	0.19	0.18
Number of observations		11,588	10,922	10,218	9,545	8,883

Notes: Numbers in parentheses are *t*-statistics based on robust firm-clustered standard errors (Petersen, 2009). Variable definitions are provided in Table II. Year dummies and industry dummies are included in each specification. For the sake of brevity, the coefficients for these dummies are not reported. ***,**,*Significance at the 1, 5 and 10 percent levels, respectively

strategies on firm performance in periods $t+1$, $t+2$, $t+3$, $t+4$, and $t+5$. As predicted, we find that the coefficient for ROA_{it}, measuring the persistence of the earnings stream, is significant and positive in all the years. The coefficient for the interaction term $ROA_{it} \times Differentiation_{it}$ is positive and significant in each of the years (0.0193, 0.0358, 0.0429, 0.0332, and 0.0410; t-statistic = 3.33, 4.06, 3.96, 2.64, and 3.21 for years $t+1$, $t+2$, $t+3$, $t+4$, and $t+5$, respectively). The coefficient for the other interaction term $ROA_{it} \times CostLeadership_{it}$ is significant only in year $t+1$ (0.0189; t-statistic = 2.69) and insignificant in all other years. Moreover, $ROA_{it} \times Differentiation_{it}$ is greater than $ROA_{it} \times CostLeadership_{it}$ in every year. The results are consistent with *H1* indicating that while both the strategies are associated with superior contemporaneous performance, the differentiation strategy is more likely to enable firms to sustain this performance into the future. This result is consistent with the premise that the positive effects of the cost leadership strategy in year t dissipate over time and do not enable firms to sustain performance in the future to the same extent as the differentiation strategy. In contrast, the coefficient on $ROA_{it} \times Differentiation_{it}$ increases over time, indicating the considerable influence of the differentiation strategy in sustaining and even improving performance in the future.

Some have argued in the literature that due to potential multicollinearity problems when using interaction terms, it is essential to determine whether a statistically significant interaction occurred in the data by testing for the significance of the increment in R^2 following the introduction of the interaction term in the regression (Cohen *et al.*, 1975). To allay this concern, we perform hierarchical regressions to test the significance of the interaction terms in our main model. The results are presented in Table VI. For each dependent variable, we perform the analysis in two steps. In the first step we enter only the main effects and control variables in Equation (2a). This forms our base model. In the second step, we enter the two interaction terms one at a time, and examine the change in R^2 from the base model. As can be seen from the table, the increments in R^2 for the interaction between ROA and Differentiation are larger than those for the interaction between ROA and Cost Leadership for all five model years. Also, we perform the incremental F-test as recommended by Cohen *et al.* (1975). The results show that the incremental F-statistic is significant in all model-years for the ROA × Differentiation interaction. However, the incremental F-statistic for the ROA × Cost Leadership interaction term is only significant for when ROA_{t+1} is the dependent variable and insignificant for all remaining model years. These results corroborate our main results.

The idea of sustainable advantage is closely tied to competition within an industry. For instance, in some industries, many competitors may adopt differentiation strategies. To compete in such an industry, a firm would have to push the boundaries of their value proposition to become distinctive (Treacy and Wiersema, 1993). If the value proposition, say, is built on brand building then a firm would need to outspend its competitors to achieve success. One could argue that the strategy variables should be considered relative to other firms in the same industry. Hence, as a robustness check we consider an alternative measure of strategy that is relative to the firm's industry peers. To construct this alternative measure, we adjust the factor scores for each firm by taking the difference between the factor score of the firm and the mean for the industry. Industry is defined based on the Fama-French (1997) 12-industry classification. We re-examine Equation (2a) using these alternative measures of strategy. The results are presented in Table VII. Similar to the results in Table V, we find that the differentiation strategy is positively and significantly associated with ROA in each of the following five

Dependent variable	Step 1: base model No interaction terms included	Step 2: enter interaction term $ROA_{i,t} \times Differentiation_{i,t}$	Step 2: enter interaction term $ROA_{i,t} \times CostLeadership_{i,t}$
ROA_{t+1}			
R^2	0.5455	0.5471	0.5457
Incremental R^2		0.0016	0.0002
Incremental F-test		19.73***	6.94***
ROA_{t+2}			
R^2	0.3359	0.3385	0.3359
Incremental R^2		0.0026	0.0000
Incremental F-test		43.00***	0.82
ROA_{t+3}			
R^2	0.2364	0.2401	0.2364
Incremental R^2		0.0037	0.0000
Incremental F-test		50.63***	0.31
ROA_{t+4}			
R^2	0.1873	0.1896	0.1873
Incremental R^2		0.0023	0.0000
Incremental F-test		27.68***	0.57
ROA_{t+5}			
R^2	0.1750	0.1786	0.1750
Incremental R^2		0.0036	0.0000
Incremental F-test		39.53***	0.41

Notes: Variable definitions are provided in Table II. ***,**,*Significance at the 1, 5 and 10 percent levels, respectively

Table VI.
Hierarchical regressions for interaction terms

years. On the other hand, we do not find a significant association of cost leadership with ROA in any of the following five years.

ROA is affected by accrual accounting (e.g. depreciation methods, inventory valuation, etc.) which could have potential implications for the inferences we make regarding the sustainability of future performance. The cash flows of a firm are not affected by these accounting choices. Hence, as a robustness check, and to ensure that our results are not being driven by accounting choice, we re-run our regressions using cash flows instead of accounting profits. Specifically, we estimate Equation (2a) replacing ROA with the cash flows from operations divided by average total assets (CFO_{t+j}). The results are presented in Table VIII. While CFO $\times$ $Differentiation_{it}$ is significantly positive in each of the years, CFO $\times$ $CostLeadership_{it}$ is significantly negative in each of the years.

Strategic positioning and risk

To understand the effects of the strategies on firm value, it is important to assess the risk associated with different strategies. Baird (1984) and Miller and Dess (1993) advocate "stability" in firm performance as a measure of predictability of performance or lower risk for firms that seek to have not only high returns but steady sources of returns. We estimate the following model to examine the impact of the strategies on the stability of ROA measured as the reciprocal of the variance of ROA in the future five years (Miller and Dess, 1993):

$$ROAStability_i = \alpha_0 + \alpha_1 Differentiation_{i,t} + \alpha_2 CostLeadership_{i,t} + \varepsilon_{i,t} \quad (4)$$

Table VII.
Sustainability of performance using alternative strategy measures

Independent variables	Pred. sign	Estimated coefficient (t-stat) $ROA_{i,t+1}$	Estimated coefficient (t-stat) $ROA_{i,t+2}$	Estimated coefficient (t-stat) $ROA_{i,t+3}$	Estimated coefficient (t-stat) $ROA_{i,t+4}$	Estimated coefficient (t-stat) $ROA_{i,t+5}$
$ROA_{t+j} = \gamma_{0j} + \gamma_{1j}ROA_{it} + \gamma_{2j}ROA_{it} \times Adj\_Diff_{it} + \gamma_{3j}ROA_{it} \times Adj\_CL_{it} + \gamma_{4j}Size_{it} + \gamma_{5j}LEV_{it}z + \gamma_{6j}BM_{it} + \gamma_{7j}AGE_{it} + \varepsilon_{it}$						
Intercept		0.0000 (0.00)	0.0011 (0.36)	−0.0117*** (−3.63)	−0.0032 (−0.99)	0.0021 (0.60)
$ROA_{i,t}$	+	0.8160*** (58.56)	0.6683*** (32.16)	0.5469*** (22.25)	0.4622*** (18.44)	0.4058*** (15.07)
$ROA_{i,t} \times Adj\_Diff_{i,t}$	+	0.0249*** (3.60)	0.0466*** (4.61)	0.0587*** (4.56)	0.0583*** (4.35)	0.0646*** (4.26)
$ROA_{i,t} \times Adj\_CL_{i,t}$	+	0.0081 (1.03)	−0.0054 (−0.44)	−0.0022 (−0.17)	−0.0053 (−0.35)	0.0030 (0.18)
$Size_{i,t}$		0.0312 (1.19)	0.0503 (1.21)	0.0838 (1.62)	0.1222* (1.99)	0.1907*** (2.70)
$LEV_{i,t}$		−0.0072*** (−6.90)	−0.0077*** (−5.84)	−0.0083*** (−5.39)	−0.0081*** (−4.92)	−0.0080*** (−4.53)
$BM_{i,t}$		0.0020*** (5.73)	0.0050*** (9.19)	0.0067*** (10.56)	0.0072*** (10.51)	0.0075*** (10.39)
$AGE_{i,t}$		0.0001*** (4.27)	0.0002*** (5.36)	0.0002*** (4.56)	0.0002*** (3.77)	0.0002*** (3.40)
Year dummies		Yes	Yes	Yes	Yes	Yes
R^2		0.55	0.34	0.24	0.19	0.17
Number of observations		11,662	11,002	10,291	9,614	8,950

Notes: Adj_Diff_{it} is the factor score on Differentiation for firm i minus the mean Differentiation score of industry (using Fama-French 12-industry definitions). Adj_CL_{it} is the factor score on CostLeadership for firm i minus the mean CostLeadership score of industry (using Fama-French 12-industry definitions). Numbers in parentheses are t-statistics based on robust firm-clustered standard errors (Petersen, 2009). Other variable definitions are provided in Table II. Year dummies are included in each specification. For the sake of brevity, the coefficients for these dummies are not reported. ***,**,*Significance at the 1, 5 and 10 percent levels, respectively

Table VIII. Sustainability of performance using cash flows

Independent variables	Pred. sign	Estimated coefficient (t-stat) $CFO_{i,t+1}$	Estimated coefficient (t-stat) $CFO_{i,t+2}$	Estimated coefficient (t-stat) $CFO_{i,t+3}$	Estimated coefficient (t-stat) $CFO_{i,t+4}$	Estimated coefficient (t-stat) CFO_{it+5}
$CFO_{t+j} = \gamma_{0j} + \gamma_{1j}CFO_{i,t} + \gamma_{2j}CFO_{i,t} \times Differentiation_{i,t} + \gamma_{3j}CFO_{i,t} \times CostLeadership_{i,t} + \gamma_{4j}Size_{i,t} + \gamma_{5j}LEV_{i,t} + \gamma_{6j}BM_{i,t} + \gamma_{7j}AGE_{i,t} + \varepsilon_{i,t}$						
Intercept		0.0439*** (11.91)	0.0446*** (10.59)	0.0578*** (12.62)	0.0668*** (13.50)	0.0661*** (12.81)
$CFO_{i,t}$	+	0.5625*** (31.76)	0.4995*** (25.56)	0.4404*** (20.91)	0.4033*** (17.80)	0.3788*** (18.00)
$CFO_{i,t} \times Differentiation_{i,t}$	+	0.0333*** (5.50)	0.0386*** (4.45)	0.0388*** (4.08)	0.0424*** (4.17)	0.0422*** (4.15)
$CFO_{i,t} \times CostLeadership_{i,t}$		−0.0469*** (−7.18)	−0.0491*** (−5.76)	−0.0522*** (−5.08)	−0.0500*** (−4.41)	−0.0405*** (−4.00)
$Size_{i,t}$		0.1738*** (3.68)	0.1565*** (2.61)	0.1789*** (2.55)	0.2124** (2.53)	0.2276** (2.17)
$LEV_{i,t}$		−0.0076*** (−3.21)	−0.0067*** (−2.92)	−0.0058*** (−2.66)	−0.0067** (−2.57)	−0.0066** (−2.14)
$BM_{i,t}$		−0.0002 (−0.20)	0.0027*** (2.79)	0.0019* (1.65)	0.0026** (1.96)	0.0033** (2.26)
$AGE_{i,t}$		0.0001 (1.48)	0.0001** (1.77)	0.0001 (1.01)	−0.0000 (−0.01)	−0.0000 (−0.60)
Year dummies		Yes	Yes	Yes	Yes	Yes
Industry dummies		Yes	Yes	Yes	Yes	Yes
Adjusted R^2		0.34	0.27	0.23	0.21	0.20
Number of observations		7,583	6,957	6,372	5,826	5,338

Notes: Numbers in parentheses are t-statistics based on robust firm-clustered standard errors (Petersen, 2009). Year dummies and industry dummies are included in each specification. For the sake of brevity, the coefficients for these dummies are not reported. $CFO_{i,t}$ is net cash flow from operating activities. Other variable definitions are provided in Table II. ***,**,*Significance at the 1, 5 and 10 percent levels, respectively

The finance literature, though, discusses two types of risk systematic or market risk, and firm-specific or unique risk (Brealey *et al.*, 2006). While firm-specific risk is not priced since it can be eliminated by constructing diversified portfolios, market risk, measured by the firm's beta, affects the valuation of firms. Thus, we estimate another model replacing $ROAStability_{it}$ with firm betas in Equation (4):

$$Beta_{i,t} = \alpha_0 + \alpha_1 Differentiation_{i,t} + \alpha_2 CostLeadership_{i,t} + \varepsilon_{i,t} \quad (5)$$

The measures for annual estimated systematic risk for firm i in year t ($Beta_{i,t}$) are obtained from CRSP data files. CRSP computes annual Scholes-William betas for firms based on market returns derived using the NYSE/AMEX value-weighted market index. Table IX shows the results from estimating Equations (4) and (5). Our results indicate that the differentiation strategy has a significant negative impact on the stability of the ROA and higher firm betas. These results are consistent with the risk-return tradeoffs observed in finance research (e.g. Brealey *et al.*, 2006). As the differentiation strategy provides higher, more sustainable profits, it also increases the riskiness of the firm as measured by the volatility of the future ROA and firm betas. This result provides strong support for *H2*.

Discussion of results

We find that even though both differentiation and cost leadership are associated with higher contemporaneous performance, the differentiation strategy allows a firm to sustain performance to a greater extent than a cost leadership strategy. We also find, though, that the differentiation strategy is associated with greater risk and volatility in performance. This suggests important trade-offs that managers must make while making decisions regarding the allocation of firm resources.

Our paper contributes to the literature on the strategy-performance link by extending it along several dimensions. First, the previous literature on this subject has

Independent variables	$ROAStability_i$ Estimated coefficient (t-stat)	$Beta_{i,t}$ Estimated coefficient (t-stat)
$ROAStability_i = \alpha_0 + \alpha_1 Differentiation_{i,t} + \alpha_2 CostLeadership_{i,t} + \varepsilon_{i,t}$		
$Beta_{i,t} = \alpha_0 + \alpha_1 Differentiation_{i,t} + \alpha_2 CostLeadership_{i,t} + \varepsilon_{i,t}$		
Intercept	0.9989*** (9,786.42)	0.9599*** (32.05)
$Differentiation_{it}$	−0.0003*** (−4.27)	0.0347*** (2.62)
$CostLeadership_{it}$	0.0001* (1.69)	−0.0086 (−0.76)
Year dummies	Yes	Yes
Industry dummies	Yes	Yes
Adjusted R^2	0.0776	0.0604
Mean number of observations	9,591	7,325

Notes: $ROAStability_i$ is measured as the reciprocal of the variance of ROA in the future five years. $Beta_{i,t}$ is the annual measure for market risk of firm i obtained from Center for Research in Security Prices (CRSP) data files. Numbers in parentheses are t-statistics based on robust firm-clustered standard errors (Petersen, 2009). Year dummies and industry dummies are included in each specification. For the sake of brevity, the coefficients for these dummies are not reported. Other variable definitions are provided in Table II. ***,**,*Significance at the 1, 5 and 10 percent levels, respectively

Table IX.
Strategic positioning and risk

focussed mainly on the contemporaneous effects of strategy on performance using cross-sectional analyses (e.g. Narver and Slater, 2000). Our study responds to calls in the literature to consider longitudinal analyses of the links of strategy with firm performance (e.g. Allen *et al.*, 2007). Longitudinal panel data enables us to examine an aspect of business performance that is distinct from contemporaneous performance, namely the persistence and sustainability of performance over time. By "sustainability" we refer to how much a firm's current profitability can be sustained in future periods. We provide empirical evidence showing that, in general, differentiation is a source of sustainable performance, while cost leadership is not. This aspect has not been considered in the prior literature. Second, our methodology utilizes strategy constructs carefully developed using multiple variables used in prior literature. Even though we utilize variables used in prior studies to capture strategy, few of these studies are based on large samples using publicly available data. Our construct development utilizing publicly available data provides three distinct advantages. First, it enables the development of a panel data set covering a substantial time period and number of firms. Second, it can be easily replicated by future researchers interested in using these constructs to answer other research questions. Third, a novel feature of our analysis is that we examine multiple aspects of firm performance – earnings, cash flows, and risk. This feature of our study enables us to elucidate critical trade-offs that managers must make while making resource allocations. Specifically, we contribute to the literature by showing that while pursuing differentiation leads to superior performance, on average, it also leads to riskier and more unstable earnings. To our knowledge, this trade-off has not been empirically examined in prior literature.

VII. Conclusions

Porter (1980) introduced a framework positing that firms which choose to implement strategies based on either differentiation or cost leadership may enjoy superior performance. Cost leadership based primarily on operational efficiencies, however, is easily imitable and the superior performance achieved through such a strategy dissipates over time (Porter, 2001). On the other hand, differentiation which is achieved through uniqueness in products and services rendered to customers allows firms to sustain superior performance over time (Porter, 1996). The primary objective of our study was to examine this notion and determine if, in fact, pursuing a differentiation strategy enables firms to sustain performance more than pursuing a cost leadership strategy.

We investigated the sustainability of performance based on the strategic positioning of firms. We found that both differentiation and cost leadership were associated with firms attaining superior contemporaneous performance. However, the differentiation strategy was associated with firms sustaining their performance to a greater extent than cost leadership. Our study of a large sample of firms over ten years confirms the conventional wisdom that adopting a differentiation strategy enables a firm to sustain superior performance more than a cost leadership strategy. Important for managers is our finding that while differentiation is a source of sustainable performance, it also increases the volatility of earnings.

While recent theories in the strategic management literature discuss the types of resources and processes that provide firms with competitive advantages, they do not provide specific guidance regarding which resources and processes are more value enhancing. Our study helps managers by providing guidance on which resource patterns provide valuable advantages leading to sustainable performance. This reinforces the importance of considering that some processes and resources are easily imitable.

If managers invest in such resources, they may be able to achieve superiority in performance in the short-run, but the advantage may not endure if competitors can easily duplicate the resources. Importantly, though, our study also underscores that not all firms would benefit from following a differentiation strategy. We document an important trade-off that managers must consider, which is, that pursuing a differentiation strategy leads to riskier and more unstable earnings. This implies that managers must carefully determine if the gains from sustainable performance outweigh the additional risk that such a strategy imposes on the different stakeholders of the firm i.e. suppliers, employees, and shareholders.

While the objective of this study was to investigate a broad research question across a range of different firms, we hope that our results will serve as a baseline for future research to investigate other interesting and related issues. We restrict our analysis to two dimensions of strategic positioning – namely, differentiation and cost leadership. While our research design allows for a firm to use both, there are interesting issues that can be explored as to whether these dimensions are substitutable or whether they complement each other. Are firms that pursue both dimensions better able to achieve sustainable superior performance or do they get "stuck in the middle?" In our study, we restrict the variables to those that can be constructed using widely available archival data across a variety of industries. Hence, we limit our analysis to proxies for strategic positioning that can be obtained using aggregate reported data. However, finer proxies may be available using field studies that focus on specific industries. Such an analysis could also provide additional insights into the characteristics of strategies within those industries and their effect on performance. For instance, we are unable to distinguish between the performance consequences of differentiation achieved via R&D vs differentiation through marketing-related activities. Similarly, our data does not enable a finer characterization of cost efficiencies achieved through scale and efficiency obtained through process innovations. Each of these could have different performance consequences. Future research can seek to address some of these interesting issues.

Notes

1. It is possible that some of the R&D expenditures involve process R&D, i.e. improving efficiencies of production processes and/or cost reduction. Unfortunately, firms are not required to disclose the proportion of product vs process R&D. As a result, our data does not capture the proportion of product R&D vs process R&D. However, studies conducted using patent data show that only a small fraction of R&D is process R&D (Scherer, 1984). Hence, we expect this variable to be associated to a much greater extent with a differentiation strategy rather than a cost leadership one. The results from the exploratory factor analysis are consistent with this conjecture.

2. Three measures were initially considered as possible indicators of firm performance: ROA, return on sales (ROS), and return on equity (ROE). ROE is known to be sensitive to differences in capital structure and was ruled out. Given that ROS and the control variables in our regression are both functions of total sales, regressions with ROS as the dependent variable might reflect mathematical artifacts as well as true relations (Farris *et al.*, 1992). Hence, we chose ROA rather than ROS as the dependent variable. However, in robustness tests (untabulated) we replaced ROA with ROS and ROE and reran our regressions. We obtained similar results using the alternative measures.

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