Stuck in the middle?

Using the exploration-exploitation lens to reconcile the generic strategy debate

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Abstract

In both research and pedagogy, strategy scholars have long distinguished between the "generic" strategies of cost leadership and differentiation, positing that the two strategies individually are superior to a "stuck-in-the-middle" strategy that combines both. However, there is little empirical evidence for this thesis. We argue this is because while cost leadership is exploitative, differentiation may be unpacked into a downstream exploitative strategy of customer intimacy and an upstream exploratory strategy of product leadership. Inferior "stuck-in-the-middle" performance is a result of a strategic mismatch that occurs when the firm combines exploratory product leadership with exploitative cost leadership. Combining exploitative customer intimacy with exploitative cost leadership avoids this mismatch, enhancing performance. Analyzing 45,132 U.S. firm-year observations from 1995 to 2015, we find strong support for our theory.

Keywords: generic strategies, Porter, stuck-in-the-middle problem, hybrid strategies, exploration, exploitation

Introduction

A dominant paradigm in the strategy literature is that generic strategies must emphasize either low cost or product differentiation, and that these are superior to strategies that combine the two (Porter, 1985, 1996). Empirical evidence regarding whether these strategies are superior to "in-the-middle" or hybrid strategies, which combine elements of both low cost and differentiation, is mixed. The literature notes that the generic strategies may be higher-level discriminants in strategy schema and calls for more nuanced explanations to link strategy with performance (Campbell-Hunt, 2000; Thornhill& White, 2007). While "in-the-middle" positioning may turn out to be successful (Barney, 1997; Grant, 2010), it may be due to contingencies that put boundary conditions on the success of the Porterian generic strategies (Hill, 1988; Adner, Ruiz-Aliseda, & Zemsky, 2016). We extend this discussion by differentiating the value chain activities involved in Porter's generic strategies into exploratory versus exploitative, based on their underlying time horizons. We argue that the stuck-in-the-middle phenomenon can arise as an outcome of combining mismatched value chain activities: some focused on short-term performance, others on the long-term.

The motivation for this study comes from the observation that while the disadvantages of hybrid strategies remain the mainstay of strategic management pedagogy, firms are often tempted to execute them in practice (Barney, 1997; Grant, 2010; Kim & Mauborgne, 2005). Firms may choose a hybrid positioning in response to changing industry conditions, customer preferences, or when competition erodes their existing competitive advantage. For example, Walmart's primary strategy of cost leadership through operational excellence worked well for decades until it was threatened by e-commerce companies. Technology companies became the first movers leveraging e-commerce to integrate cost leadership based on operational excellence

with differentiation based on mass customization. A top executive at Amazon noted, "Amazon is a technology company. We just happen to do retail really well" (McCarty, 2011). Amazon is known to use technology to offer dynamic pricing and to create perceptions of lower prices (Del Rey, 2015; Fishman, 2017; Xia, Monroe, & Cox, 2004). As a response, Walmart aggressively expanded its technology base through acquisitions and internal R&D (Cheng, 2018) to increase its engagement with its customers beyond its stores, while retaining its cost focus. Similarly, Apple's traditional differentiation strategy was based on customer intimacy achieved through a seamless UX and brand building. When this hit the cost hurdle in fast growing, price-sensitive emerging markets around 2016, it made operational changes by adding low cost, lower feature phones to its portfolio. Apple hoped to combat the dominance of cheaper android-based smart phones in these markets by integrating differentiation- with cost-based advantages and offering both the premium and low-cost iPhone models (Wu & Gurman, 2020).

As a basis for our arguments, we use the generic strategy characterization provided by Treacy and Wiersema (1995), namely product leadership, operational excellence, and customer intimacy, since these three strategies closely map onto the value chain. Product leadership and customer intimacy are two dimensions of the generic strategy of differentiation. Our premise is that while these two strategies are applicable at the two ends of the value chain, they are fundamentally different in character. Specifically, product leadership at the upstream end of the value chain requires activities like R&D and design that are exploratory in the sense of March (1991), i.e., involving "search, variation, risk taking, experimentation, play, flexibility, discovery, innovation" (March, 1991: 71). In contrast, customer intimacy at the downstream end of the value chain is based on activities like marketing and after sales service that are predominantly exploitative in nature and involve "refinement, choice, production, efficiency,

selection, implementation, execution" (March, 1991: 71). The cost leadership strategy, which is achieved through operational excellence, applies to the center of the value chain and is also exploitative in character.

Our arguments rest on the time horizons and consequent resource allocation decisions associated with exploratory and exploitative activities within the firm. The exploratory product leadership strategy fits under the strategic budget with a longer time horizon to generate future returns. Exploitative operational excellence and customer intimacy fall under the operational budget with a shorter time horizon focused on current returns. Hence, a hybrid strategy combining exploratory product leadership (differentiation) with exploitative operational excellence (cost leadership) heightens the tension between the strategic and operational budgets, leading to inferior performance as compared to the two individual strategies. However, combining the two exploitative strategies of customer intimacy (differentiation) and operational excellence (cost leadership) avoids the tradeoff between two disparate budgets in the short term. As a result, a hybrid strategy combining operational excellence with customer intimacy performs better than the constituent generic strategies and avoids the "stuck-in-middle" problem.

We tested our arguments on a dataset of 4,986 public firms in the United States. Specifically, we used their 10-K reports filed from 1995 until 2015, and developed a textual measure of their strategic positioning of product leadership, operational excellence, and customer intimacy. Using Compustat, we measured their short-term performance as return on equity (ROE) and long-term performance as the market-to-book (MTB) ratio. Our results show that firms aligning the exploitative generic strategies may be able to avoid Porter's (1985, 1986) predicted stuck-in-the-middle pitfalls. By moving from the two-dimensional strategic choices of

differentiation versus cost leadership to a three-dimensional framework based on the value chain, we offer a resolution to the stuck-in-the-middle puzzle.

We make several significant contributions to both theory and empirical analysis in this paper. First, we begin the process of resolving the decades-old puzzle in strategic management – many firms implement strategies that have elements of both cost leadership and differentiation and yet manage to show superior performance. Second, we braid together two of Porter's (1985, 1986) classic contributions to the strategy literature: generic strategies and the firm's value chain. In the process, we advance our understanding of the theory of competitive advantage using the lens of exploration-exploitation (March, 1991). This enables us to identify differentiation with high knowledge activities at the ends of the value chain and cost leadership with operational activities in the middle. Third, as we unpack differentiation into two constituent components, we uncover a vital strategic dichotomy: while developing and commercializing new products and services is exploratory in nature, delivering them to customers is much more exploitative. Fourth, we develop a novel tool of textual analysis to assess firms' strategic positioning, a tool that may be applied to wide variety of research questions in strategic management.

Theory and hypotheses

Generic strategies and exploration-exploitation

At the heart of strategic positioning is the relationship between customer's "willingness to pay" (WTP) for a good or service and the cost incurred by the firm to deliver it (Porter, 1985). In the textbook economics model, the customer's WTP arises from his/her downward sloping demand curve. One of Porter's (1985) seminal insights was to recognize that the position of the customer's demand curve can be affected by firm strategy. The firm can either take the customer's demand curve (and the associated WTP) as given and work to provide its product or

service at a lower price than its competitors (cost leadership). Alternatively, it can distinguish itself and create its own demand curve that is distinct from its competitors and has a higher associated customer WTP (differentiation). Thus, Porter's generic strategies can be thought of as mutually exclusive and collectively exhaustive approaches, since the firm can either take the customer's demand curve as given or work to change it by increasing the WTP by more than it costs to distinguish its offering. As is well known, the two generic strategies create value through different modalities – cost leadership through scale and differentiation through higher margins and mark-ups.

The firm can separate itself from its competitors and achieve a higher WTP through developing better products or services. It can also stand out by delivering a superior customer experience. While both of these approaches fall under the heading of a differentiation strategy, they are structurally different. Treacy and Wiersema (1995) unpack differentiation into two components, referring to the first as product leadership and the second as customer intimacy. In addition, they equate cost leadership with what they call operational excellence.

We take Treacy and Wiersema's (1995) three-way unpacking of differentiation and link it to another Porterian concept namely the firm's value chain, layering on the associated time horizons. The firm achieves product leadership by activities like R&D, design, technology improvements and innovations that it undertakes at the input (upstream) end of the value chain. It delivers customer intimacy from activities like sales and after sales service that is implemented at the output (downstream) end. In contrast, operational excellence involving activities such as reducing cost and overheads, better asset utilization, improving operational efficiency, and economies of scale and scope are activities that are situated in the middle of the value chain.

Porter (1985) notes that "a firm that engages in each generic strategy but fails to achieve any of them is 'stuck in the middle'. It possesses no competitive advantage" (p.16). In this case, the firm straddles across the value chain in an attempt to achieve both differentiation and lower cost. However, such a positioning may be difficult to attain and it is argued that it will be impossible to sustain (Porter, 1985; Treacy and Wiersema, 1995). The logic for this argument is that firms that concentrate on each generic strategy will out-compete such a hybrid-strategy firm in each dimension, e.g., the cost leaders will offer lower prices and the differentiators will offer higher quality products or services. Porter and the strategy scholars who have followed in his trail (e.g., Campbell-Hunt, 2000; Smith & Grimm, 1987; Thornhill & White, 2007) based their arguments on the logic that the capabilities necessary to achieve each of the generic strategies are orthogonal to each other, so that no firm can achieve preeminence along both dimensions. In short, firms that implement hybrid strategies may increase organizational complexity, do not offer a clear value proposition to the customers, and are outperformed by both cost leaders and differentiators (Chew, 2000).

We argue that executing a hybrid strategy is similar to combining exploration and exploitation in an organization, a classic interest of strategy scholars, especially within the research stream on ambidexterity (Benner & Tushman, 2002; Gupta, Smith, and Shalley, 2006; He & Wong, 2004; O'Reilly & Tushman, 2013; Tushman & O'Reilly, 1996). The value chain activities involved in Porter's generic strategies are exploratory or exploitative by their very nature. Ambidexterity scholars emphasize that it is crucial for firms excel at both in order to create sustained competitive advantage (Raisch & Birkinshaw, 2008).

Product leadership: Differentiation through product leadership occurs at the input end of the value chain and tends to be exploratory in nature. It may create new sources of value (March,

1991) by beating the norms of technological performance and pushing the industry's frontier forward (Cantwell & Mudambi, 2005; Treacy & Wiersema, 1995). These activities include conducting basic or applied R&D, developing technology and products for the unknown future, adopting emerging technologies, effectively responding to disruptors, and so on.

As experimentation is their guiding principle, product leader firms also face highly uncertain and distant payoffs (March, 1991; Mudambi & Swift, 2014). Firms in this category adopt a real options approach and maintain a portfolio of projects to manage market and technological uncertainties (McGrath & Nerkar, 2004; Oriani & Sobrero, 2008). The cost of maintaining such portfolio of technological bets can be quite large depending on the industry, and many of them generate negative returns (Cano-Kollmann, Awate, Hannigan, & Mudambi, 2018).

Operational excellence: On the other hand, firms practicing the strategy of operational excellence maintain consistently low costs through efficient and standardized operating procedures. This Fordian approach is seldom exploratory and enjoys the benefits of repeatedly exploiting existing sources of value. As Treacy and Wiersema (1995) noted, "[o]perationally excellent companies reject variety…produce no-frills products for the middle of the market where demand is huge and customers are more interested in cost than in choice" (p. 51). Rephrasing Henry Ford, such firms offer "any color you want as long as it's black" (Treacy & Wiersema, 1995, p.51). With a predominant focus on standardization, the innovations that arise from the shop floor tend to be incremental and involve learning-by-doing that exploit existing resources and capabilities (Levinthal and March, 1993). Such exploitations by operationally excellent firms result in near-term value capture with more certainty, unlike the exploratory activities of firms implementing product leadership strategies. For instance, popular

manufacturing innovations such as lean or agile manufacturing are inspired from a response to the market conditions in the near term (Narasimhan, Swink, & Kim, 2006; Naylor, Naim & Berry, 1999). Their payoffs appear immediately as they achieve a fit with the current internal and external contexts of the firm (Bozarth & McDermott, 1998; Hill, 1994; Kotha & Orne, 1989; Miller & Roth, 1994).

Customer intimacy: Unlike operational excellence, a firm focusing on customer intimacy strives for variety in order to satisfy a broad range of existing customers' requirements and deepen the firm's involvement with the existing accounts, or to attract new customers and broaden the base of the firm's accounts. Differentiation under this strategy is achieved primarily through activities at the output or marketing end of the value chain, and may not always involve cutting edge technologies or the lowest cost. Their focus is on improving customer experience typically through some combination of superior customer service, brand, reputation, greater responsiveness, customized solutions, and timely service. However, most of these activities tend to exploit the existing capabilities of the firm with results obtained from the market in the near term. Differentiating through marketing activities may have temporary or persistent effects on performance (Dekimpe & Hanssens, 1999; Sridhar, Narayanan, & Srinivasan, 2014); however, the value capture from them tends to occur in the near term (Chakravarti & Grewal, 2011), unlike product leadership strategies.

Balancing exploration and exploitation in a hybrid strategy

As we have noted, the three strategies of product leadership, customer intimacy and operational excellence may be mapped into the two dimensions of exploration and exploitation. One form of hybrid strategy may combine differentiation through product leadership in the upstream with cost advantage through operational excellence in the mid-stream (Lavie &

Rosenkopf, 2006; March, 1991; Rothaermal & Deeds, 2004). The second form of hybrid strategy may combine operational excellence, which brings cost advantage in the mid-stream, with customer intimacy from downstream differentiation. We argue that the key strategy mismatches are not between cost leadership and differentiation, but rather between exploration and exploitation. Combining exploration and exploitation under a hybrid strategy has direct implications for resource allocation decisions inside the firm.

Firms constantly balance the trade-offs between the exploratory strategic budget and the exploitative operational budget (Goold & Quinn, 1990; Lechner & Floyd, 2012). Strategic budgets promote long-term investments that improve the firm's competitive advantage (Hayes & Abernathy, 1980). These investments support exploratory initiatives that may create new sources of value and capabilities (Woolridge & Snow, 1990), similar to activities involved in a product leadership strategy. Strategic budgets have larger upfront investment and put pressure on liquidity in the current period. The investments in this category realize value in the long term and require lower discount rates in order to result in positive net present value (Souder, Reilly, Bromiley, & Mitchell, 2016).

Operational budgets on the other hand meet the current demands of the firm, such as the financial objectives for a given year (Goold & Quinn, 1990). The strategies of operational excellence and customer intimacy, with their relatively more certain and immediate returns, are factored into operational budgets. Investments under these strategies look attractive even with the conservative discount rates that are commonly used in practice (Jagannathan *et al.*, 2016; Sauder *et al.*, 2016). As these investments favor short term returns, they are more likely to attract short term investors, may deter patient capital, and affect long term performance (Eccles,

Ioannou, & Serafeim, 2014; Porter, 1992; Souder *et al.*, 2016). These arguments lead to the following baseline hypotheses:

H_0-A: *The strategy of product leadership increases the long-term firm performance. On the other hand, the strategies of customer intimacy and operational excellence decrease the long-term firm performance when implemented individually.*

H_0-B: *The strategy of product leadership decreases the short-term firm performance. On the other hand, the strategies of customer intimacy and operational excellence increase the short-term firm performance when implemented individually.*

Further, the literature notes that exploratory strategic budgets compete with operational budgets for the resources at a given point in time, creating the classic issues of budget trade-offs (Burgelman, 1983; Drucker, 1993; Souder & Bromiley, 2012), managerial myopia (Levinthal & March, 1993; Miller, 2002), and reduced strategic orientation (Hayes & Abernathy, 1980; Porter, 1992). The classic work by Cyert and March (1963) established a behavioral trait of managers who prefer short term over the long-term returns. The unrealistically large discount rates used by the managers compress value of large long-term returns, resulting in exploratory projects being rejected (Sauder *et al.*, 2016). The reasons for short termism are rooted in basic human behavior (Kahneman, Slovic, & Tversky, 1982), which then gets amplified by investor pressure (Bushee, 1998) and managers' career concerns (Narayanan, 1985).

In our context, the preceding discussion points out the inherent managerial and investor bias against exploratory product leadership that may therefore suffer from underinvestment (Sauder *et al.*, 2016). We argue that if they are made to compete for resources with exploitative short-term strategies, the execution of product leadership strategies will suffer further. An example of this situation is a hybrid strategy of product leadership combined with operational

excellence. The combination compounds resource allocation challenges and creates incoherent investment horizons leading to the classic stuck-in-the-middle problem identified by Porter. Such a hybrid strategy is likely to underperform the constituent strategies in both the short term and the long term. However, a combination of two exploitative strategies such as customer intimacy and operational excellence may not suffer from the same challenge. Their discount rates would be aligned and so would be their investment horizons. They would attract homogeneous short-term investors that share common goals with the firm's management (Stein, 1988).

Further, in the long term, the exploitative activities under operational excellence and customer intimacy may reinforce each other's performance horizons (Weick & Roberts, 1993; Lechner & Floyd, 2012). The managers running these activities may form coalitions to compete with the exploratory product leadership activities. In addition, such an exploitative coalition may be stronger in competing for resources compared to the constituent individual groups. Hence, a hybrid strategy combining differentiation through exploitative customer intimacy with operational excellence may be superior in the long term as compared to the two constituent strategies involved.

In contrast, when exploratory activities under the product leadership strategy are allied exploitative activities under operational excellence, the two groups of managers do not form a coalition with homogeneous goals and requirements (Burgelman, 2002; Lechner & Kreutzer, 2010). These two groups are likely to compete for resources, so that a hybrid strategy that combines differentiation through exploratory product leadership with operational excellence, which belongs to the exploitative camp, will perform more poorly in the long term when compared with its constituent strategies. We thus hypothesize:

H1: *A hybrid strategy of combining differentiation through product leadership and cost advantage through operational excellence yields lower short-term as well as long-term firm performance as compared to the constituent strategies of product leadership and operational excellence.*

H2: *A hybrid strategy of combining differentiation through customer intimacy and cost leadership through operational excellence yields higher short-term and long-term firm performance than the constituent strategies of customer intimacy and operational excellence.*

Our hypotheses are consistent with the research on organizational ambidexterity that stress that both exploration and exploitation are crucial to the maintenance of sustained competitive advantage. However, within this body of literature, our theory development is supportive of sequential ambidexterity (Mudambi & Swift, 2014), rather than the simultaneous pursuit of both exploration and exploitation.

Research methodology

Research setting and data

This study uses data on U.S. public firms, excluding those in the financial and utility industries. We collected data from three sources. First, we gathered annual Form 10-K filings from 1995 to 2015 from the Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) which automatically collects and validates the submission by firms who are required to file forms with the U.S. Securities and Exchange Commission (SEC). We constructed textual measures of the strategies of product leadership, operational excellence, and customer intimacy, using the 10-K filings. Second, we collected financial data and firm characteristics from Compustat. Third, we collected data on stock returns for all U.S. public firms from the Center for Research in Security Prices (CRSP). We restricted the sample to firm-year observations with a stock price greater than

$1 and eliminated observations with the ratio of current period sales to prior period sales being less than 0.5 or greater than 2.0, to account for potential non-articulating transactions such as mergers and acquisitions or significant divestitures. These procedures yielded an unbalanced sample of 4,986 firms (45,132 firm-year observations) from the fiscal year 1995 to 2015.

Variables

Dependent variables: To test our hypotheses, we used two dependent variables that measured firm performance. The first dependent variable, Market-to-Book ratio (MTB), was calculated as a firm's market valuation relative to the book value of its assets. MTB was selected as a long-term performance measure because it measures firms' long-term prospects and captures the creation of competitive advantage. In addition, we used accounting-based measures of return on equity (ROE) to capture current profitability. We calculated ROE as earnings before extraordinary items divided by the market value of equity.

Explanatory variables: We created a three-dimensional measure of the strategies of product leadership, operational excellence, and customer intimacy based on the texts extracted from Item-1 under the business section of 10-K filings. Firms are required to discuss their product market and business operations under Item-1. We examined only Item-1 rather than the entire 10-K to provide a relatively uniform context for our textual analysis. Then, we inferred firms' strategy using the occurrences of strategy-related words under each Item-1. We specifically searched for the occurrences of strategy-related words that captured both overall strategic positioning and the focus on activities in different functions along the value chain. Table 1 includes a complete list of the keywords and phrases used for this analysis.

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We transformed the word frequency matrix into a three-dimensional measure using factor analysis with the principal-factor method and varimax rotation. Three factors were retained that explained 87.8% of the variance. We used these factor scores as the continuous measures that captured firms' orientation towards each strategy: product leadership, customer intimacy, and operational excellence. By construction, these three strategy variables are orthogonal to each other as well as continuous, allowing us to capture the intensity of the strategies employed by the firms. It also enables us to create interactions to capture the effects of hybrid strategies.

A crucial point that we wish to make here is that our explanatory variables capture the intensity of the firm's *emphasis* on particular strategies, not the execution of the strategies themselves. Hence, an intense emphasis on product leadership may or may not be accompanied by superior performance in producing innovation or new products. Similarly, a strong emphasis on operational excellence may or may not actually result in superior performance in the firm's operations; and the same is true of customer intimacy. Our objective in this paper is test the link between the firm's articulated strategic posture and its financial performance.

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Control variables: Firm performance depends on several additional factors for which we used control variables. Prior literature shows the importance of industry context on strategic performance (Caves & Porter, 1978; McGahan & Porter, 1997; Rumelt, 1991; Waring, 1996). Therefore, we included industry level control variables as follows. We used *number of peer firms* and the *average size of peer firms* to control for their ability to match each other's strategies and average out the performance in an industry (George, 2005). We controlled for the *industry concentration* using the Herfindahl and Hirchman Index (HHI) to control for performance heterogeneity due to industry structure (Dess and Beard, 1984). We also controlled for the

industry turbulence as the standard deviation of industry sales for the last three years to account for performance heterogeneity due to the industry lifecycle (Karniouchina *et al.*, 2013). In addition, we controlled for the different performance levels of *hi-tech industries* (Thornhill, 2006) using a categorical variable derived from the OECD classification of SIC codes describing technological intensity of the industry (Goldschlag & Miranda, 2016).

In addition, we controlled for firm-level characteristics that are known to impact firm performance. We used *Firm size* as the natural logarithm of market valuation at the beginning of the year, and *Firm age* as the natural logarithm of the numbers of years since the firm was included in Compustat. Further, we controlled for the *intangible assets* that have an effect on the firm performance (Srivastava, Shervani, & Fahey, 1998; Teece, Pisano, & Shuen, 1997). Additionally, we accounted for financial slack using the *current ratio*, *cash holding*, and *financial leverage* available to the firm (Bromiley, 1991; George, 2005; Tan & Peng, 2003). We also controlled for the operational efficiency of the firm using the *cost of goods sold* and *inventory holding* (Narasimhan, Swink & Kim, 2006). We used the levels of *R&D intensity* and *marketing intensity* to control for the firm's capabilities (Han, Kim, & Srivastava, 1998; Kotabe, Srinivasan, & Aulakh, 2002; McAlister *et al.*, 2016). Further, we included the *lagged terms of performance* measures on the right-hand side of the regression models given that past performance is a strong predictor of current performance (Craighead, Hult, & Ketchen, 2009). Finally, year dummies were included to accommodate time trends, and industry dummies, based on the two-digit SIC code, to control for unaccounted industry specific heterogeneity.

Results

Table 3 shows univariate statistics and variables correlations. Most of the correlations are within acceptable limits, except a few high correlations (> 60%), which we explored further in the

robustness tests. We tested our hypotheses using panel multiple regression with standard errors clustered by firm and year (Correia, 2017). This approach allowed the residuals of a given firm to be correlated across years and the residuals of a given year to be correlated across firms. Since we did not know the precise form of the dependency, we used two-way clustering to correct for the standard errors (Petersen, 2009).

-- Insert Table 3 here --

We tested the baseline hypotheses using the direct effects of the three strategy variables (product leadership, operational excellence, and customer intimacy) and the hybrid strategy hypotheses using the interactions of the strategy variables. Table 4 shows the effect on MTB. Model 1 contains control variables, and Model 2 adds the strategy variables to it. Models 3 through 5 individually add the interaction of two strategies to form a hybrid strategy. Model 6 is the full model containing all of the strategy variables.

As seen in all the models of Table 4, the exploratory strategy of product leadership consistently produces a positive significant effect on the long-term firm performance. On the other hand, the exploitative operational excellence consistently produces a negative and significant effect on long-term firm performance. (Recall our note above that emphasizing a strategy of operational excellence may or may not be accompanied by successfully executed operations.) Customer intimacy, an exploitative strategy in our theorization, produces an insignificant effect. These results thus provide partial support to our baseline hypothesis H_0-A.

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Further, Models 4 and 6 show the effect of hybrid strategy that combines exploratory product leadership with exploitative operational excellence, which is negative and significant. The result supports Porter's classical stuck-in-the-middle problem where the firm combines

differentiation with cost advantage to form a hybrid strategy. Models 5 and 6 show the effect of combining the two exploitative strategies of customer intimacy and operational excellence, which is another form of a hybrid strategy. This combination however produces a positive and significant effect in Model 6. This result does not support stuck-in-the-middle problem: in fact it shows improvement in performance over its component strategies. In addition, Models 3 and 6 show the effect of combining product leadership with customer intimacy. Although this is not the classic Porterian hybrid strategy, as both strategies focus on differentiation, we find that the combination of these exploratory and exploitative differentiation strategies also reduce the long-term firm performance, further supporting our exploration-exploitation arguments.

Using MTB results as an example, we illustrate the performance implications of hybrid strategies in Figures 1 and 2. Figure 1 shows that in our sample, a strategy of operational excellence has a negative impact on MTB which becomes worse with an increasing emphasis on product leadership. On the other hand, Figure 2 shows that the negative effect of a strategy of operational excellence on MTB drastically improves and becomes positive with an increasing emphasis on a strategy of customer intimacy, for most of our sample. In sum, the results show that the exploratory product leadership strategy should be strictly followed as a strategy to achieve higher long-term performance, as noted in our hypothesis H1. Emphasizing exploitative operational excellence, while detrimental as a strategy in the long run, can be made effective by combining it with exploitative customer intimacy, as noted by our hypothesis H2.

--- Insert Figures 1 and 2 here ---

Table 5 shows the effects on short term firm performance, measured as ROE. Model 7 contains only the control variables, Model 8 adds our three strategy variables to it. Models 9 through 11 individually add hybrid strategy variables. Model 12 is the full model with all of the

strategy variables, including hybrids. The exploratory product leadership strategy has direct effect that is negative and significant across all short term models, as expected. On the other hand, the exploitative customer intimacy strategy produces a positive significant effect consistently across all the models. However, we find that operational excellence, by itself, produces an insignificant effect on short-term performance. These results provide partial support to our baseline hypothesis H_0-B.

Models 10 and 12 show the effect of combining product leadership with operational excellence on short-term performance. The effect is found to be insignificant. This result does not provide support to the classical stuck-in-the-middle hypothesis that predicts a negative effect of such a hybrid strategy. Models 11 and 12 show the effect of hybrid customer intimacy and operational excellence strategy on the short-term performance, which is positive and significant. Figure 3 depicts this case where the effect of operational excellence on the predicted ROE significantly improves at higher levels of customer intimacy for most of our sample. Thus, the results show that short term performance improves with a hybrid strategy of customer intimacy and operational excellence as noted in our hypothesis H2. We predicted in hypothesis H1 that a hybrid strategy of product leadership and operational excellence would be associated with a deterioration in short-term performance, a position for which we do not find support.

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--- Insert Figure 3 here ---

Discussion

Our objective in this paper is to address one of the longstanding puzzles in strategic management. While Porter's (1985, 1986) "stuck-in-the-middle" proposition has a prominent place in strategy theory and pedagogy, its empirical support has not been nearly as strong. We

unravel this puzzle by linking fundamental Porterian concepts, generic strategies and the firm's value chain. We analyze the firm's strategies using an exploration-exploitation lens (March, 1991), wherein exploration encompasses, in the main, long term activities, whereas exploitation is more concerned with the short term.

A key component of our analysis is to unpackage the generic strategy of differentiation into exploratory product leadership at the upstream end of the value chain and exploitative customer intimacy at the downstream end. In contrast, cost leadership is more directly related to exploitative operational excellence in the middle of the value chain. We claim that the "stuck-in-the-middle" phenomenon is the outcome of combining strategies that are incompatible in terms of their time horizons. Thus, a strategy of product leadership is long-term oriented and incompatible with either of the short-term oriented strategies of operational excellence or customer intimacy. In short, we theorize that the "stuck-in-the-middle" phenomenon arises from a hybrid strategy that combines long- and short-term oriented strategies.

However, a hybrid strategy of cost-based operational excellence and differentiation-based customer intimacy is composed of individual strategies that are both short-term oriented, and does not exhibit this time horizon incompatibility. Our empirical results support our theoretical position that the "stuck-in-the-middle" phenomenon arises only with hybrid strategies that combine cost- and differentiation-based advantages with incompatible time horizons. Relating Porter's generic strategies of cost leadership and differentiation to the firm's value chain leads us to the conclusion that the incompatibility that gives rise to the phenomenon is related to the time horizon and not strategy per se.

Our results point out the importance of combining strategies whose investment time horizons are aligned so that the associated resource allocation decisions are harmonized. In our

empirical results, such harmonization is associated with both short- and long-term performance improvements. However, when the hybrid strategy combined exploitative activities with exploratory activities, the underlying investment horizons were incongruent. In the short-term, we found no significant effect of this hybrid strategy in our empirical results. However, in the long-term, the combination is associated with lowered firm performance compared to the constituent strategies.

In summary, a differentiation strategy through product leadership may require a purist approach whereby firm focuses solely at the upstream value chain, directs investments toward exploratory activities, and maintains a longer investment horizon. An alternative to this purist approach may be a hybrid strategy of differentiation through customer intimacy and cost advantage through operational excellence. Thus, our theory and empirical analysis propose a resolution to the longstanding "stuck-in-the-middle" puzzle in strategy research and pedagogy using the exploration-exploitation lens.

In this manner, our resolution is also related to ambidexterity, another important body of strategy research (O'Reilly & Tushman, 2013). In particular, our theory and empirical evidence is supportive of a particular strand of this research, namely sequential ambidexterity (Mudambi & Swift, 2014). Pursuing exploration and exploitation sequentially rather than simultaneously minimizes the strategic incoherence that leads to the "stuck-in-the-middle" phenomenon.

Our study also presented the use of text analysis as a tool to measure a firm's strategic orientation on a continuous scale. Using readily available public data, e.g. the 10-K reports, our approach is extendable to a much larger sample covering majority of the industries and a longer period of time, as compared to the prior studies in this area of inquiry. While our keyword

selection for the text analysis is exhaustive, further studies may include additional keywords for a more refined analysis.

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Table 1: Keyword list for text analysis

Strategic positioning: *differenti*, unique*, superior*, premium*, excellen*, leading edge, upscale, high* price*, high* margin*, high* end*, inelasticity*, cost leader*, low* pric*, low* cost*, cost advantage*, competitive pric*, aggressive pric**
Operations: *efficien*, high* yield*, process* improvement*, asset* utilization*, capacity* utilization*, scope*, scale*, breath*, broad, mass, high* volume*, large* volume*,* economy* of scale, *new* product*, quality*, reliab*, durable**
Marketing: *marketing*, advertis*, brand*, reputation*, trademark**
Service: *customer* service*, consumer* service*, customer* need*, sales support*, post-purchase service*, customer* preference*, consumer* preference*, consumer* relation*, consumer* experience*, consumer* support*, loyalty*, customiz*, tailor*, personaliz*, responsive*, on time, timely*
Technology: *innovate*, creativ*, research and development, R&D, techni*, technolog*, patent*, proprietar**
Infrastructure: *control* cost*, control* expense*, control* overhead*, minimiz* cost*, minimiz* expense*, minimiz* overhead*, reduce* cost*, reduce* expense*, reduce* overhead*, cut* cost*, cut* expense*, cut* overhead*, decreas* cost*, decreas* expense*, decreas* overhead*, monitor* cost*, monitor* expense*, monitor* overhead*, sav* cost*, sav* expense*, sav* overhead*, cost* control*, cost* minimization*, cost* reduction*, cost* saving*, cost* improvement*, expense* control*, expense* minimization*, expense* reduction*, expense* saving*, expense* improvement*, overhead* control*, overhead* minimization*, overhead* reduction*, overhead* saving*, overhead* improvement**
Human resources management: *talent*, train*, skill*, intellectual propert*, human capital**

Table 2: Rotated factor loading

Keywords	Product leadership	Customer intimacy	Operational excellence
technolog	0.6961		
proprietary	0.5113		
R&D	0.4770		
intellectual propert	0.4691		
patent	0.4487		
techni	0.3317		
reliab	0.3285		
new product	0.3231		
brand		0.5490	
quality		0.3613	
marketing		0.3281	
customer service		0.3276	
innovat		0.3079	
trademark		0.3022	
reduce cost			0.3737
efficien			0.3684
low cost			0.3621
improve cost			0.3184

Note: The factor analysis is based on textual data for 67,728 firm-year observations excluding observations in the financial and utility industries. We retained three factors that explained 87.8% of the variance in the sample. The blank cells in the table indicate that the corresponding keywords had absolute factor loading of less than 0.3. Further, we do not include in this table those keywords with the absolute factor loading less than 0.3 for all factors.

Table 3: Correlations, means, and standard deviations

	Variables	Mean	S.D.	-1	-2	-3	-4	-5	-6	-7	-8	-9
-1	MTB	2.08	1.53	1								
-2	ROE	-0.03	0.24	0.05	1							
-3	Product leadership	0.02	0.85	0.20	-0.06	1						
-4	Customer intimacy	0.09	0.82	-0.03	0.05	-0.01	1					
-5	Operational excellence	0.06	0.77	-0.15	0.00	0.06	0.05	1				
-6	Firm size	6.00	2.00	0.13	0.16	-0.06	0.05	-0.05	1			
-7	Firm age	2.65	0.60	-0.17	0.10	-0.11	-0.01	-0.03	0.22	1		
-8	Current ratio	2.83	2.40	0.14	0.04	0.27	-0.10	-0.10	-0.14	-0.10	1	
-9	Cash holding	3.58	2.17	0.09	0.09	0.09	0.01	-0.06	0.77	0.17	0.07	1
-10	Financial leverage	0.21	0.21	-0.14	-0.15	-0.28	-0.03	0.03	0.08	0.02	-0.33	-0.06
-11	Cost of goods sold	-0.01	0.97	-0.06	0.06	-0.12	0.01	0.02	0.50	0.23	-0.18	0.43
-12	Inventory holding	0.13	0.14	-0.17	0.03	-0.13	0.24	0.12	-0.18	0.13	0.02	-0.26
-13	R&D intensity	0.13	0.48	0.29	-0.16	0.21	-0.16	-0.18	-0.07	-0.14	0.31	0.03
-14	Marketing intensity	0.01	0.03	0.07	-0.03	-0.11	0.29	-0.17	0.07	-0.04	-0.04	0.07
-15	Intangible assets	0.17	0.20	-0.10	0.05	0.02	0.13	-0.04	0.22	0.04	-0.21	0.10
-16	Number of peer firms	0.02	0.99	0.24	-0.07	0.44	-0.08	-0.10	-0.04	-0.19	0.15	0.05
-17	Peer firm size	8.06	8.42	-0.08	0.03	-0.28	0.14	0.13	0.13	0.11	-0.16	0.08
-18	Industry concentration	0.07	0.06	-0.11	0.03	-0.30	0.10	0.14	0.03	0.07	-0.12	-0.03
-19	Industry turbulence	0.00	1.00	0.06	-0.04	0.13	-0.16	-0.08	0.09	0.01	0.06	0.11
-20	Industry ROE	-1.08	1.45	-0.08	0.09	-0.17	0.07	0.06	0.00	0.06	-0.07	-0.03
-21	Technology class	0.34	0.47	0.19	-0.06	0.54	-0.18	-0.03	-0.04	-0.08	0.27	0.11

Table 3 continued

	Variables	-10	-11	-12	-13	-14	-15	-16	-17	-18	-19	-20	-21
-10	Financial leverage	1											
-11	Cost of goods sold	0.08	1										
-12	Inventory holding	-0.05	0.04	1									
-13	R&D intensity	-0.07	-0.08	-0.16	1								
-14	Marketing intensity	0.00	0.00	0.03	-0.04	1							
-15	Intangible assets	0.19	0.05	-0.26	-0.09	0.06	1						
-16	Number of peer firms	-0.18	-0.14	-0.27	0.23	-0.02	0.04	1					
-17	Peer firm size	0.09	0.23	0.12	-0.12	0.05	-0.01	-0.40	1				
-18	Industry concentration	0.08	0.13	0.18	-0.15	0.02	-0.08	-0.49	0.37	1			
-19	Industry turbulence	0.00	0.06	-0.09	0.14	-0.06	-0.01	0.37	0.02	-0.31	1		
-20	Industry ROE	0.03	0.05	0.10	-0.11	0.01	-0.05	-0.29	0.19	0.20	-0.15	1	
-21	Technology class	-0.22	-0.12	-0.08	0.29	-0.10	-0.04	0.50	-0.24	-0.35	0.22	-0.16	1

Table 4: Regression results for MTB as the dependent variable

VARIABLES	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Product leadership$_t$			0.063	[0.017]	0.070	[0.011]	0.069	[0.011]	0.061	[0.021]	0.075	[0.009]
			(0.024)		(0.025)		(0.024)		(0.024)		(0.026)	
Customer intimacy$_t$			0.002	[0.806]	-0.001	[0.915]	0.005	[0.597]	0.001	[0.900]	-0.000	[0.993]
			(0.009)		(0.010)		(0.009)		(0.009)		(0.010)	
Operational excellence$_t$			-0.053	[0.000]	-0.051	[0.000]	-0.054	[0.000]	-0.055	[0.000]	-0.054	[0.000]
			(0.011)		(0.011)		(0.011)		(0.011)		(0.011)	
Product leadership$_t$ * Customer intimacy$_t$					-0.041	[0.001]					-0.043	[0.001]
					(0.011)						(0.011)	
Product leadership$_t$ * Operational excellence$_t$							-0.030	[0.006]			-0.029	[0.007]
							(0.010)				(0.010)	
Customer intimacy$_t$ * Operational excellence$_t$									0.011	[0.148]	0.016	[0.038]
									(0.007)		(0.007)	
Firm size$_t$	-0.016	[0.175]	-0.013	[0.270]	-0.013	[0.259]	-0.013	[0.267]	-0.013	[0.267]	-0.013	[0.253]
	(0.011)		(0.011)		(0.011)		(0.011)		(0.011)		(0.011)	
Firm age$_t$	0.005	[0.852]	0.003	[0.893]	0.004	[0.856]	0.005	[0.818]	0.003	[0.904]	0.006	[0.796]
	(0.024)		(0.023)		(0.023)		(0.023)		(0.023)		(0.023)	
Current ratio$_t$	-0.044	[0.622]	-0.038	[0.674]	-0.042	[0.640]	-0.034	[0.702]	-0.039	[0.668]	-0.040	[0.658]
	(0.088)		(0.089)		(0.088)		(0.089)		(0.089)		(0.088)	
Cash holding$_t$	0.004	[0.480]	0.003	[0.528]	0.002	[0.638]	0.003	[0.534]	0.003	[0.527]	0.002	[0.650]
	(0.005)		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)	
Financial leverage$_t$	0.307	[0.227]	0.275	[0.277]	0.242	[0.333]	0.273	[0.279]	0.275	[0.276]	0.240	[0.337]
	(0.246)		(0.246)		(0.244)		(0.246)		(0.246)		(0.244)	
Cost of goods sold$_t$	0.027	[0.154]	0.026	[0.173]	0.027	[0.169]	0.027	[0.174]	0.027	[0.172]	0.027	[0.167]
	(0.019)		(0.019)		(0.019)		(0.019)		(0.019)		(0.019)	
Inventory holding$_t$	-0.042	[0.000]	-0.044	[0.000]	-0.044	[0.000]	-0.044	[0.000]	-0.044	[0.000]	-0.045	[0.000]
	(0.005)		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)	
R&D intensity$_t$	-0.137	[0.042]	-0.106	[0.093]	-0.105	[0.095]	-0.105	[0.096]	-0.106	[0.094]	-0.103	[0.101]
	(0.063)		(0.060)		(0.060)		(0.060)		(0.060)		(0.060)	
Marketing intensity$_t$	0.017	[0.053]	0.014	[0.092]	0.014	[0.093]	0.014	[0.088]	0.014	[0.086]	0.014	[0.082]
	(0.008)		(0.008)		(0.008)		(0.008)		(0.008)		(0.008)	
Intangible assets$_t$	-0.009	[0.193]	-0.011	[0.135]	-0.010	[0.143]	-0.010	[0.139]	-0.010	[0.139]	-0.010	[0.152]
	(0.007)		(0.007)		(0.007)		(0.007)		(0.007)		(0.007)	
Number of peer firms$_t$	-0.574	[0.000]	-0.531	[0.000]	-0.550	[0.000]	-0.540	[0.000]	-0.533	[0.000]	-0.561	[0.000]
	(0.085)		(0.078)		(0.080)		(0.080)		(0.078)		(0.081)	
Peer firm size$_t$	0.037	[0.230]	0.019	[0.447]	0.012	[0.615]	0.020	[0.439]	0.019	[0.450]	0.012	[0.618]
	(0.030)		(0.025)		(0.024)		(0.025)		(0.025)		(0.024)	
Industry concentration$_t$	0.231	[0.000]	0.220	[0.000]	0.214	[0.000]	0.216	[0.000]	0.218	[0.000]	0.207	[0.000]
	(0.031)		(0.031)		(0.031)		(0.031)		(0.031)		(0.030)	
Industry turbulence$_t$	0.585	[0.092]	0.470	[0.193]	0.441	[0.222]	0.483	[0.182]	0.502	[0.166]	0.496	[0.172]
	(0.330)		(0.349)		(0.350)		(0.349)		(0.349)		(0.350)	
Technology	-0.551	[0.000]	-0.565	[0.000]	-0.569	[0.000]	-0.565	[0.000]	-0.564	[0.000]	-0.568	[0.000]

$class_t$	(0.065)		(0.065)		(0.066)		(0.065)		(0.065)		(0.065)	
MTB_{t-1}	0.681	[0.000]	0.677	[0.000]	0.676	[0.000]	0.677	[0.000]	0.677	[0.000]	0.676	[0.000]
	(0.028)		(0.028)		(0.028)		(0.028)		(0.028)		(0.028)	
Industry FE	YES		YES		YES		YES		YES		YES	
Year FE	YES		YES		YES		YES		YES		YES	
Number of firms	4,986		4,986		4,986		4,986		4,986		4,986	
Number of observations	45,132		45,132		45,132		45,132		45,132		45,132	
Adjusted R-squared	0.622		0.623		0.623		0.623		0.623		0.623	
Model F-stat	296	[0.000]	347.6	[0.000]	344.4	[0.000]	400.2	[0.000]	360.2	[0.000]	395	[0.000]

Note: Standard errors, clustered by firm and year, are in parentheses. P-values are between square brackets. All tests are two-tailed.

Table 5: Regression results for ROE as the dependent variable

VARIABLES	Model 7		Model 8		Model 9		Model 10		Model 11		Model 12	
Product leadership$_t$			-0.012	[0.004]	-0.012	[0.003]	-0.011	[0.004]	-0.012	[0.003]	-0.012	[0.002]
			(0.004)		(0.004)		(0.003)		(0.004)		(0.003)	
Customer intimacy$_t$			0.006	[0.004]	0.007	[0.003]	0.007	[0.004]	0.006	[0.007]	0.006	[0.005]
			(0.002)		(0.002)		(0.002)		(0.002)		(0.002)	
Operational excellence$_t$			-0.000	[0.886]	-0.000	[0.842]	-0.000	[0.881]	-0.001	[0.591]	-0.001	[0.575]
			(0.002)		(0.002)		(0.002)		(0.002)		(0.002)	
Product leadership$_t$ * Customer intimacy$_t$					0.002	[0.326]					0.002	[0.436]
					(0.002)						(0.002)	
Product leadership$_t$ * Operational excellence$_t$							-0.002	[0.399]			-0.002	[0.396]
							(0.002)				(0.002)	
Customer intimacy$_t$ * Operational excellence$_t$									0.004	[0.007]	0.004	[0.009]
									(0.001)		(0.001)	
Firm size$_t$	0.013	[0.000]	0.013	[0.000]	0.013	[0.000]	0.013	[0.000]	0.013	[0.000]	0.013	[0.000]
	(0.002)		(0.002)		(0.003)		(0.003)		(0.002)		(0.003)	
Firm age$_t$	0.021	[0.000]	0.021	[0.000]	0.021	[0.000]	0.021	[0.000]	0.021	[0.000]	0.021	[0.000]
	(0.004)		(0.004)		(0.004)		(0.004)		(0.004)		(0.004)	
Current ratio$_t$	-0.021	[0.103]	-0.021	[0.095]	-0.021	[0.098]	-0.021	[0.096]	-0.022	[0.092]	-0.021	[0.094]
	(0.012)		(0.012)		(0.012)		(0.012)		(0.012)		(0.012)	
Cash holding$_t$	0.002	[0.082]	0.002	[0.086]	0.002	[0.080]	0.002	[0.087]	0.002	[0.085]	0.002	[0.081]
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
Financial leverage$_t$	0.009	[0.925]	0.004	[0.966]	0.006	[0.951]	0.004	[0.966]	0.004	[0.964]	0.006	[0.953]
	(0.096)		(0.096)		(0.096)		(0.096)		(0.096)		(0.096)	
Cost of goods sold$_t$	-0.000	[0.576]	-0.000	[0.587]	-0.000	[0.586]	-0.000	[0.586]	-0.000	[0.586]	-0.000	[0.586]
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
Inventory holding$_t$	-0.004	[0.519]	-0.004	[0.533]	-0.004	[0.531]	-0.004	[0.534]	-0.004	[0.536]	-0.004	[0.534]
	(0.007)		(0.007)		(0.007)		(0.007)		(0.007)		(0.007)	
R&D intensity$_t$	0.006	[0.000]	0.007	[0.000]	0.007	[0.000]	0.007	[0.000]	0.007	[0.000]	0.007	[0.000]
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
Marketing intensity$_t$	-0.177	[0.000]	-0.180	[0.000]	-0.181	[0.000]	-0.180	[0.000]	-0.180	[0.000]	-0.180	[0.000]
	(0.018)		(0.017)		(0.017)		(0.017)		(0.017)		(0.017)	
Intangible assets$_t$	-0.002	[0.221]	-0.002	[0.243]	-0.002	[0.243]	-0.002	[0.248]	-0.002	[0.263]	-0.002	[0.266]
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
Number of peer firms$_t$	-0.002	[0.143]	-0.002	[0.222]	-0.002	[0.217]	-0.002	[0.228]	-0.002	[0.231]	-0.002	[0.233]
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
Peer firm size$_t$	-0.044	[0.016]	-0.057	[0.003]	-0.056	[0.003]	-0.057	[0.003]	-0.057	[0.003]	-0.057	[0.003]
	(0.017)		(0.017)		(0.017)		(0.017)		(0.017)		(0.017)	
Industry concentration$_t$	-0.015	[0.002]	-0.009	[0.055]	-0.009	[0.058]	-0.009	[0.056]	-0.009	[0.053]	-0.009	[0.056]
	(0.004)		(0.005)		(0.004)		(0.005)		(0.005)		(0.004)	
Industry ROE$_t$	-0.065	[0.000]	-0.064	[0.000]	-0.063	[0.000]	-0.064	[0.000]	-0.064	[0.000]	-0.064	[0.000]
	(0.006)		(0.006)		(0.005)		(0.006)		(0.006)		(0.006)	

Industry turbulence$_t$	-0.371 (0.063)	[0.000]	-0.419 (0.068)	[0.000]	-0.417 (0.068)	[0.000]	-0.418 (0.068)	[0.000]	-0.407 (0.068)	[0.000]	-0.406 (0.068)	[0.000]
Technology class$_t$	0.075 (0.015)	[0.000]	0.072 (0.015)	[0.000]	0.072 (0.015)	[0.000]	0.072 (0.015)	[0.000]	0.072 (0.015)	[0.000]	0.072 (0.015)	[0.000]
ROE$_{t-1}$	0.253 (0.039)	[0.000]	0.252 (0.039)	[0.000]	0.251 (0.038)	[0.000]	0.252 (0.039)	[0.000]	0.251 (0.039)	[0.000]	0.251 (0.039)	[0.000]
Industry FE	YES		YES		YES		YES		YES		YES	
Year FE	YES		YES		YES		YES		YES		YES	
Number of firms	4,986		4,986		4,986		4,986		4,986		4,986	
Number of observations	45,132		45,132		45,132		45,132		45,132		45,132	
Adjusted R-squared	0.190		0.190		0.191		0.190		0.191		0.191	
Model F-stat	62.31	[0.000]	55.14	[0.000]	56.53	[0.000]	53.36	[0.000]	53.95	[0.000]	51.48	[0.000]

Note: Standard errors, clustered by firm and year, are in parentheses. P-values are between square brackets. All tests are two-tailed.

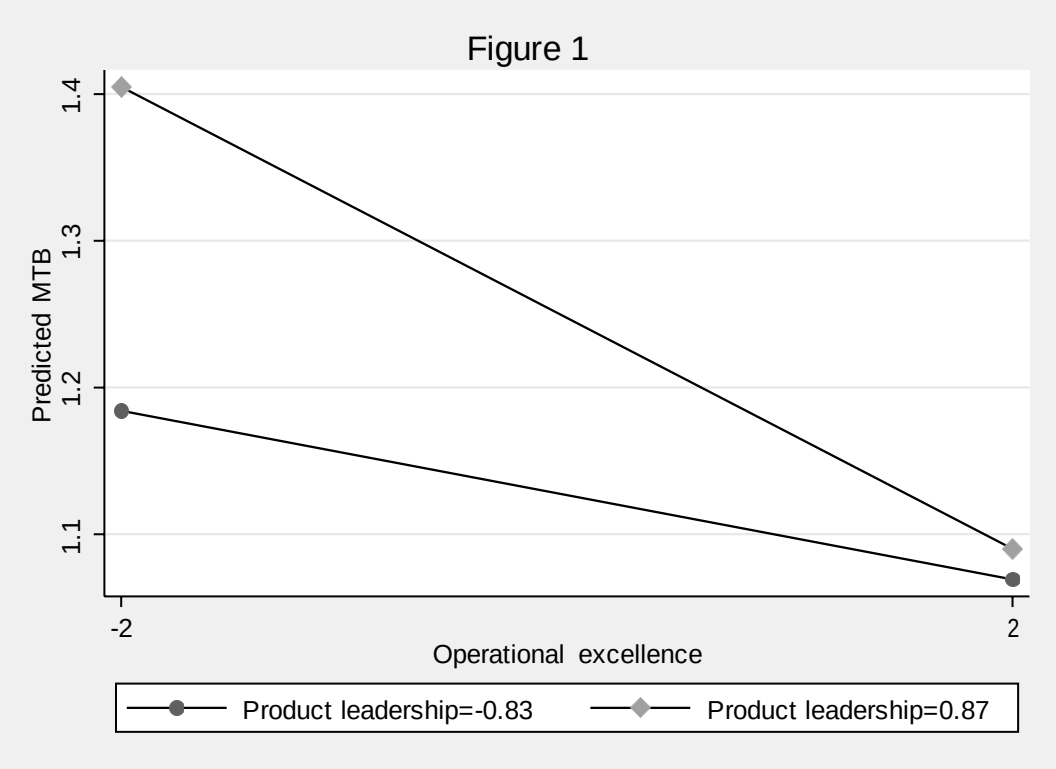

Figure 1: The effect of operational excellence on predicted MTB at two values (mean ± 1 std. deviation) of product leadership

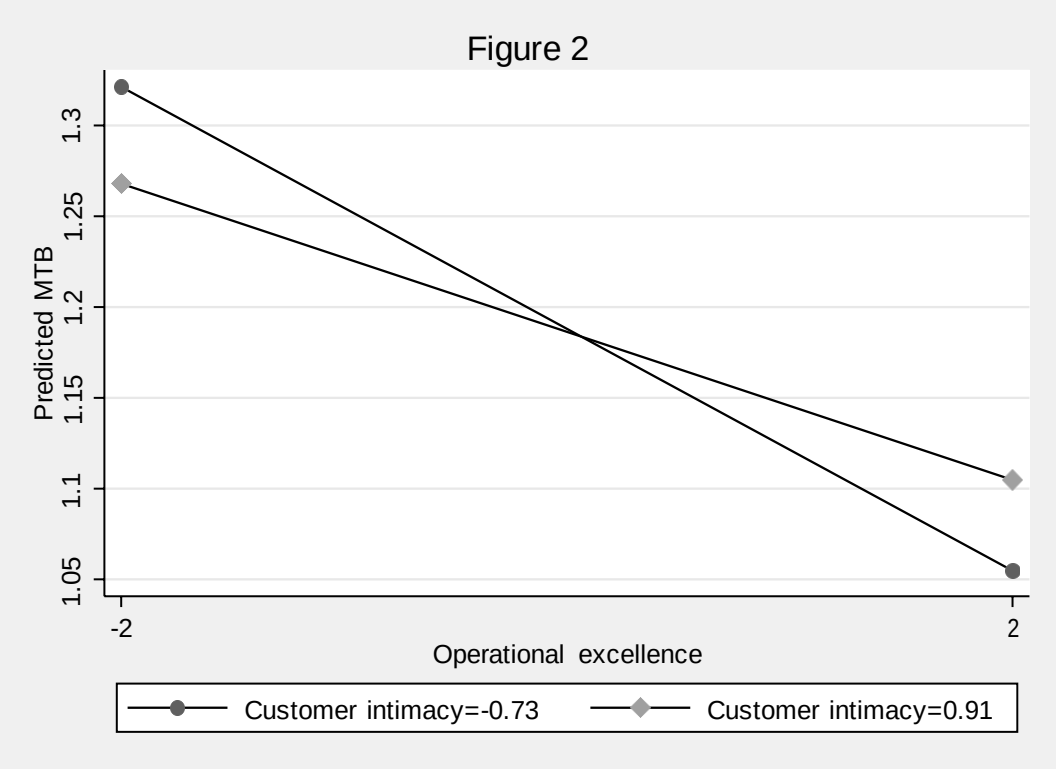

Figure 2: The effect of operational excellence on predicted MTB at two values (mean ± 1 std. deviation) of customer intimacy

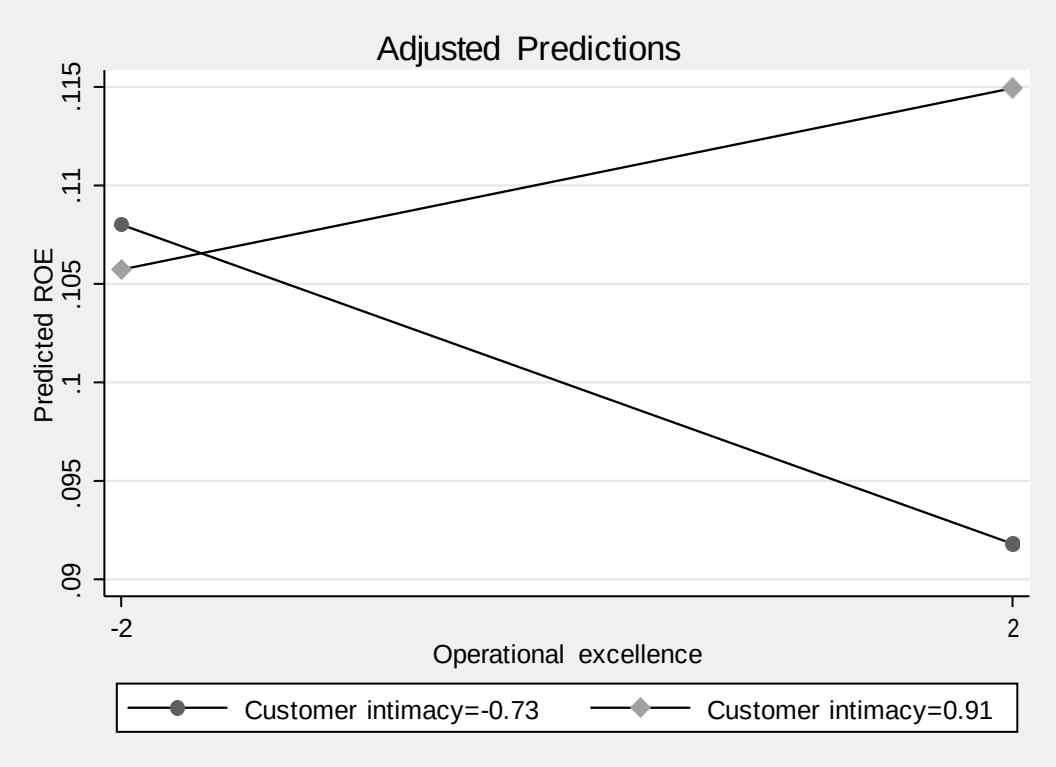

Figure 3: The effect of operational excellence on predicted ROE at two values (mean ± 1 std. deviation) of customer intimacy