A Textual Measure of Business Strategy

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ABSTRACT

This paper uses text parsing analysis on managerial self-disclosure in regulatory Form 10-K and develops a three-dimensional measure of business strategy for a large-sample over 22 years. To ensure content validity, we draw the keyword list from prior literature. Adding to the face validity of the three-dimensional measure, we show that the measure exhibits substantial variation across and within industries and changes over time in responding to economic shocks. We also observe an overall persistent trend of the measure, indicating that the measure has high test-retest reliability. Further, we examine construct validity and find that the measure behaves as theory predicts. We find evidence that different strategies imply different resource allocation to strategic investments, affect important earnings properties and accounting policies, and have different implications on firm performance.

Keywords: Business strategy; Competitive advantage; Textual analysis
1. Introduction

This paper examines managers’ self-disclosure of business strategy. Financial analysis textbooks recommend assessing both industry competition environment and business strategy to start firms’ evaluation (Palepu and Healy 2007; Penman 2012). Business strategy involves how should firm compete in a given industry, which can be considered as a plan that guides the firm’s alignment with its environment and shapes its internal policies (Hambrick 1983a). Due to the importance of this piece of information to investment and voting decisions, the SEC requires firms’ narrative description of business in annual reports (Regulation S-K 17 CFR 229.10). Even, SEC recently solicits comments on whether to explicitly require disclosures of a registrant’s strategy in annual reports (SEC concept release No. 33-10064). Therefore, whether we can obtain information about firms’ business strategy from the current self-disclosures on business description remains to be a question. We develop a measure of business strategy leveraging managers’ self-disclosure made in Form 10-K and conduct a series of validity checks. We show that the measure of strategy is a persistent construct as expected and despite that, we find the measure captures time-series variation that corresponds to historical shocks. Moreover, we show that our measure captures intra-industry and inter-industry variation in strategy that explains firm operation decisions and future performance.

Classic work on typologies of business strategy provides the basis for our large-scale empirical analysis. Building on prior findings, Porter (1980) derives suggestive conceptual typologies to obtain competitive advantage: differentiation (e.g., innovation, marketing, product quality) and cost leadership (e.g., direct cost control).1 Similarly, Miles and Snow (1978) propose a framework that labels firms as prospectors and defenders. These frameworks that have been discussed repeatedly in strategy literature state that differentiators or prospectors compete with unique products or services that have high customer value and enable price premium while cost leaders or defenders attract customers with competitive pricing (Segev 1989). Although these frameworks did not distinguish among differentiators, Miller (1986) reviews the work of Miles and Snow (1978), Porter (1980), Hambrick (1983a, 1983b), and Dess and Davis (1984) and concludes that there are two different types in differentiation: innovating differentiation and marketing

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1 The third typology in Porter’s (1980) framework is focus, which can be viewed as business-level strategy or corporate-level strategy (Miller 1986). We decide to not study focus strategy in this paper because it measures the degree to which a firm covers its industry rather than the approach to gain competitive advantage.
differentiation. Innovating differentiators differentiate by coming out with new products and emphasize on pioneering while marketing differentiators are forceful marketers and rarely the first out with new products. Later studies split differentiation into innovating differentiation and marketing differentiation and find empirical evidence showing that innovating differentiation and marketing differentiation have very different implications on firm operations (e.g., Dess et al. 1997, Kim and Lim 1988, Miller 1988, Zahra and Covin 1993). The extended three-dimensional framework of business strategy goes beyond strategy literature. After extensive research on trends and operations in firms, Treacy and Wiersema (1995) solidify the typology and label them in a practitioner-orientated fashion as product leadership, customer intimacy, and operational excellence. In managerial accounting area, Kaplan and Norton (2000) incorporate the three-dimensional framework of business strategy into balanced scorecard and highlight its importance to guide firm operations and generate customer value.

Given the importance of business strategy in firm evaluations and academic literature, this study develops and validates a direct measure of the well-received three-dimensional strategy (innovating differentiation, marketing differentiation, and cost leadership). We analyze the textual data filed through SEC, leveraging the fact that SEC requires firms to provide a narrative outline of the general character of the business done and intended to be done in Form 10-K Item 1 Business. We focus on Item 1 of the Form 10-K to examine the statutorily prescribed and, thus, comparable information source across firms. We examine words that capture both overall strategic positioning and detailed function-level focus and count the keyword frequency for each Item 1 from 1995 to 2016. This measure assumes that word frequency reflects the intensity of the focus (Weber 1990). We conduct principal component analysis to reduce high-dimensional word frequency matrix to latent factors. We obtain three factors that can be interpreted as corresponding to innovating differentiation, marketing differentiation, and cost leadership where the factors are labeled by examining the words that loaded high for each factor. As a result, the three-dimensional measure of business strategy is three standardized weighted averages of keyword frequency that are orthogonal to each other. The fact that publicly traded firms must file a Form 10-K in each year allows us to generate a three-dimensional measure for each firm-year observation for U.S. public firms over 22 years.
We conduct a battery of checks to validate the three-dimensional textual measure. First, we examine cross-sectional variation both across and within industries. Strategy can be associated with the characteristics of industry environment, which leads to certain strategy-environment combinations (Danny Miller 1987; Hambrick 1983a). Still, firms within most industries vary in their emphasis on strategic positioning, allowing for the identification of strategy (Hambrick 1983a; Miles and Snow 1978). As expected, we find variation across industries: industries related to business equipment have high average values on innovating differentiation, industries related to nondurables goods high on marketing differentiation, and industries related to construction high on cost leadership. We also observe substantial inter-industry variation, showing that firms essentially compete with their peers in various ways. Having distinguished industry tendencies and strategy, we then move to time-series variation. On one hand, strategy is supposed to be enduring, especially when managerial values and firm resources become more and more geared toward the existing strategy (D Miller 1981). Even when firms manage to change strategy, they may blur firm image, confuse customers, and eventually suffer from deteriorated performance (Porter 1996). We check test-retest reliability and find the three-dimensional measure to be quite reliable, persistent over time, and not mobile, consistent with the expectation that strategy is a long-term concept. On the other hand, some firms do change their strategies occasionally, especially when facing environmental shifts (Zajac and Shortell 1989). In our sample, we do find changes over time that correspond to historical shocks and expected time patterns are also observed for submarkets in supply chain and IT sectors. Overall, these pieces of evidence add to the face validity of our measure and suggest that managers’ self-disclosure provides reasonably accurate and updated information on strategy.

Next, we test construct validity or the degree to which the measure behaves as theory predicts. Strategy is presumed to shape firms’ internal features in terms of functional policies, structure, and processes (Porter 1985; Miles and Snow 1978). For instance, firms may achieve internal consistency by making certain investments that are aligned with their chosen strategies (Hambrick 1983a; Conant, Mokwa, and Varadarajan 1990). That is, firms need to invest in R&D to pursue innovating differentiation, advertising to pursue marketing differentiation, and modern equipment to pursue cost leadership. For this reason, our primary validity test is to verify the relation between strategy and strategic investments. We find that firms invest more heavily in R&D in the concurrent when managers use more innovative-differentiation-related keywords to discuss their business (i.e., a
higher score on innovating differentiation factor). We also find firms spending more on advertising and marketing activities when the score on marketing differentiation factor increases and more on capital expenditure when the score on cost leadership factor increases. In addition, we find incremental power of strategy to predict subsequent strategic investments after controlling for concurrent investments, suggesting that our textual analysis approach captures additional and timelier information on strategy.

We also test whether time-series earnings properties vary across firms depending on the extent to which they pursue the three strategies. Since innovative differentiators commit to long-term investments in intangible assets to build barriers to imitation, it is hard for these firms to make quick strategy changes or mid-course corrections when faced with unfavorable results such as negative earnings (Ghemawat 1991). At the same time, strategic investments of these firms, R&D, are more exploratory in nature and face considerably higher outcome uncertainties than marketing differentiators and cost leaders. Therefore, we expect earnings of innovative differentiators to be more persistent but also more volatile than those of other firms. We test the association between business strategy and both earnings persistence (first-order autoregression) and earnings volatility (rolling standard deviation of the past four years) and confirm that innovative differentiators have more persistent and also more volatile earnings, which stands in contrast to the negative correlation between persistent and volatility for the sample of all listed firms documented by Dichev and Tang (2009) and Frankel and Litov (2009).

We then move to explore the association between business strategy and accounting policies. Firms with different strategies create different intangible assets through strategic investments, which in turn leads to differences in the consequences of their accounting policies. Under current accounting regulation, firms immediately expense intangible assets (Kothari, Ramanna, and Skinner 2010). Therefore, firms with high intangible assets exhibit higher observed balance-sheet conservatism and lower observed income-statement conservatism because intangible assets are not recognized on the balance sheet and any bad news associated with these unrecorded intangible assets do not trigger asset write-downs (Watts 2003). Similarly, firms with high intangible assets exhibit weaker matching between contemporaneous expenses and revenues because intangibles are generally expensed before revenue realization. Since innovative differentiators commit to long-term investment in intangibles as we document, we expect they have lower income-statement
conservatism and weaker revenue-expense matching. We test the association between business strategy income-statement conservatism (reverse regression of earnings on return) and revenue-expense matching (Dichev and Tang 2008) and find empirical evidence consistent with our expectations.

Moreover, we document that firm performance varies with strategy. We find predictable patterns relating strategy to DuPont components of accounting profitability. Marketing differentiation and cost leadership firms have higher efficiency ratios since they pursue higher profits through lean operations. Also, marketing differentiation firms have higher margins as their unique positioning enables them to command a higher price premium. Additionally, we further explore the associations between strategy and various comprehensive performance measures and find evidence of the “liability of newness” (Stinchcombe 1965). Innovating differentiation firms have lower ROA, which may be partially attributable to the fact that R&D expenses cannot be capitalized as assets and hence reduce net income under the U.S. GAAP (Lev and Sougiannis 1996). For stock return which incorporates investors’ expectations for future performance, we do not find significant differences among firms with different strategies. For long-term performance, we find that innovating differentiation firms have a greater market-to-book ratio and, hence, greater growth prospects.

In this cross-disciplinary study, we explore an emerging dataset of firms’ narrative disclosure and employ textual analysis to develop a three-dimensional measure on business strategy. In response to the concerns of both time-series and cross-sectional boilerplate in Form 10-K (SEC Release No. 33-10618), this research appeals to managers, investors, and regulators by providing insights about the usefulness of the textual disclosure in Form 10-K, particularly on business description. Moreover, exploring new possibilities to examine textual data in accounting research, this paper contributes to the existing lines of literature using textual analysis to study economic issues (e.g., Hoberg and Phillips 2016, Li et al. 2013, Loughran and McDonald 2011). Finally, since business strategy is an important construct that goes beyond strategy literature to accounting, operations, and finance, the validated three-dimensional measure developed in this paper opens the door to future studies in multiple disciplines.

One of the benefits of the three-dimensional measure is to assign each firm-year observation three separate scores that are orthogonal to each other, which provides more information and
flexibility for future research than simply forcing the strategy to vary alone one dimension. Most studies investigate two competitive advantages and choose to construct two measures for each or simply assume the two are two extremes of one continuum and construct a single measure (e.g., Bentley et al. 2013, David et al. 2002, Ittner et al. 1997). Moreover, the textual three-dimensional measure allows us to observe within-industry and cross-industry variations over many years. Many prior strategy-related studies that rely on managers’ self-typing (e.g., Slater and Olson 2001) and panels’ external assessments (e.g., Zott and Amit 2008) focus on single industries during a short period. The difficulty and cost of using these methods to obtain data limit the scope of empirical studies. Finally, the textual approach is more likely to capture the intended strategy. It compliments the measured based on accounting numbers which is more likely to capture the realized strategy and help us to avoid circular reasoning compared to use accounting numbers to examine the impact of strategy on firm operations and performance (Bentley et al. 2013; Mintzberg 1987).

The remainder of the paper is organized as follows. We describe strategy in Section 2 and discuss methodological details of the measure in Section 3. In Section 4, we examine the properties and external validity of the new measure. Section 5 tests the implications for strategic investments and firm performance. Section 6 discusses potential future research and Section 7 concludes.

2. Business strategy
How firms compete in their industries is central to managers and researchers. Business strategy guides firms to position themselves in their industries and to obtain a competitive advantage over their rivals. Meanwhile, it also shapes firms’ decisions on internal structures and operations. Given the exploratory nature of this study, we choose to examine the well-received three-dimensional framework of business strategy (innovating differentiation, marketing differentiation, and cost leadership). It is a high-level abstraction of business strategy that appears to account for significant variations across firms and allows the strategy construct to be operationalized in other than industry-specific terms (Dess and Davis 1984; Hambrick 1983a). Appendix A.1 lists the most highly cited papers on business strategy typologies.

The strategy of innovating differentiation requires continuous improvements in the functionality and performance of products. Such major innovations generally involve complex processes of trials and errors and managers’ frequent updates in the operation process. Firms with innovating differentiation command high price premiums with the high customer value delivered
through new products in order to compensate for the costs of innovations. The strategy of marketing differentiation focuses on building quality customer relationships and creating customer loyalty. Aggressive marketing efforts may be needed. Firms with marketing differentiation also charge price premiums. They manage to do that with more favorable and appealing images but not necessarily with more up-to-date products. The strategy of cost leadership attracts customers primarily because they cost less than competitors’ equivalent products. To achieve the low-cost position in the industry, firms with cost leadership pay great attention to asset use, operational efficiency, and discretionary expense.

Strategy is a long-term concept and supposed to be enduring (D Miller 1981). Changes in strategy can be painful and costly (Dess and Davis 1984). Firms rarely have the desire to change strategy. To implement the intended strategy, it normally requires firms’ commitment and consistent long-term effort (Ghemawat 1991). It is well accepted that frequent changes in the intended strategy would send confusing signals to employees and customers, disrupt daily operations, blur firm image, and finally lead to poor performance (Porter 1996). Firms’ ability to change strategy is also limited. Once the effort to build firms’ structures and systems is placed, it cannot be easily modified and may create hurdles for subsequent changes in the intended strategy (Hannan and Freeman 1984). However, firms may attempt to move rapidly from one strategy to another when changes are absolutely necessary or advantageous (Danny Miller 1986). For example, due to the close association between industry environment and strategy, firms may change gear to a more appropriate environment/strategy combination in the face of industry shifts (Zajac and Shortell 1989).

To implement the intended strategy and to build barriers to imitation, managers make decisions accordingly for internal consistencies in firm structure, operation, and process (Porter 1985; Treacy and Wiersema 1993). The thesis of structure following strategy is initiated by Chandler (1962). Later studies find evidence suggesting that firms with different strategies show different functional attributes such as top management tasks (Hambrick 1983a), accounting control systems (Simons 1987), administrative mechanisms (Vijay Govindarajan 1988), marketing competencies (Conant, Mokwa, and Varadarajan 1990), technology policy (Zahra and Covin 1993), managerial social capital (Acquaah 2007), and business model (Zott and Amit 2008). One fundamental aspect of internal consistencies is to invest strategically. Innovating differentiation
firms tend to initiate more R&D activities so that they can keep delivering cutting-edge products and render competitors’ products obsolete. Marketing differentiation firms spend more on advertising and marketing so that they can connect with their target market, serve customers’ preferences, and cultivate loyalty. Finally, cost leadership firms tend to invest more in Property, Plant, and Equipment (PPE) to leverage contemporary technology and improve efficiency and automation of operations.

The differences in strategic investments of firms with different strategies lead to differences in earnings properties. Project-level innovation activities of innovative differentiators require development and commitment for much longer periods than advertising activities of marketing differentiators and efficiency improvement activities of cost leaders (Porter 1996). As a result, innovative differentiators have more difficulties and challenges to change gears even in the face of negative earnings or adverse financial results, leading to more persistent earnings. Moreover, firms with different strategies face different levels of outcome uncertainty, which significantly influences earnings volatility. Research and development activities of innovative differentiators generally are exploratory and have ambiguous cause-effect connections between actions due to their complex integration of tactics and capabilities. On the contrary, activities to improve efficiency of cost leaders are mainly through internally-oriented learning from past experience and bring the lowest outcome uncertainty (V. Govindarajan and Gupta 1985; Kothari, Laguerre, and Leone 2002; Rajagopalan and Finkelstein 1992).

Business strategy affects accounting policies including conservatism and matching between revenues and expenses mainly due to accounting regulation and not manipulation. As mentioned, innovative differentiators who invest heavily in intangible assets such as R&D that are less verifiable and normally recognized before revenue realization. Since increases in separable asset values are recognized in book value only when they are completely verifiable under current accounting regulation, the greater focus on R&D activities brings more cumulated unrecognized assets. Therefore, for innovative differentiators, we would observe less evidence of income-statement conservatism which captures the asymmetric timing in recognition of good news and bad news of recognized assets: bad news related to unrecognized intangible assets does not trigger assets write-down in these firms (Lafond and Roychowdhury 2007; Roychowdhury and Watts 2007). At the same time, the large R&D expenses that are generally recognized before revenue
realization reduce the matching between revenues and contemporaneous expenses (Dichev and Tang 2008).

Firm performance varies with strategy as well. Differentiation efforts should be reflected in higher profit margins and improved operational efficiency will lead to a higher asset turnover ratio (Selling and Stickney 1989). Therefore, innovating differentiators and marketing differentiators will have higher margins compared to cost leaders. Cost leaders, on the other hand, have a higher asset turnover ratio as they pay special attention to asset utilization (Porter 1985). Marketing differentiators operate efficiently as well since their target customers tend to be homogenous (Treacy and Wiersema 1993). For overall firm performance, normative theory contends that firms with different properly-implemented strategies have same performance level and those who fail to implement a clear strategy experience poor performance (Porter 1985; Miles and Snow 1978). The empirical analysis in later studies shows mixed results. Some find that the entrepreneurial behavior of differentiators brings better performance (e.g., David et al. 2002, Zott and Amit 2008) while others find the opposite (e.g., Berman et al. 1999, Dess and Davis 1984, Kotha and Nair 1995). The mixed results can be partially driven by the heterogeneous definitions of firm performance and partially driven by the fact that these studies examine data from various time periods and industries, suggesting that the environmental and organizational complexities can be contingency factors that moderate the relationship between strategy and performance (Drazin and Van de Ven 1985).

3. Measurement
We measure the three-dimensional strategy (innovating differentiation, marketing differentiation, and cost leadership) using textual data from 10-K filings. Regulation S-K requires accurate description and timely updates in Form 10-K Item 1 Business where firms describe their business, products and services, and competitive position. In this case, we leverage information provided by firm insiders disclosed in a statutorily prescribed form that has been widely used in prior accounting and finance research (e.g., Hoberg and Phillips 2016, Loughran and Mcdonald 2010). We gather textual data from SEC filings of Form 10-K and its variant filed from the calendar year 1995 to 2017.² For most 10-Ks, Item 1 Business is followed by Item 2 or Item 1A after 2005 (Bao and Datta 2014). Therefore, we parse Item 1 by identifying the textual content between keywords “Item 1”

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² Most digital versions of SEC filings are not available prior to 1995. We obtain 10-K parse files that essentially cleans each document of markup tags, ASCII-encoded graphics, and tables from Professor Bill McDonald at https://sraf.nd.edu/data/stage-one-10-x-parse-data/.
and “Item 2” or between “Item 1” and “Item 1A”. After linking the extracted Item 1 documents to Compustat financial data using the central index key (CIK) and mapping to fiscal years based on the 10-K filing date and firms’ fiscal year-end, we obtain a sample of 102,704 observations from fiscal years 1995 to 2016. The sample further reduces to 76,306 when we exclude firms in the financial and utility industries.

We infer firms’ strategy by counting the word frequency in extracted Item 1 documents, assuming that the frequency count represents the intensity of focus and concern in a given document (Weber 1990). In other words, we expect a focal firm pursuing a certain strategy uses more words associated with the strategy in describing themselves. To ensure content validity, that is our measure represents all facets of the construct, we build the keyword list on prior literature on Porter (1985), Miller (1986), Treacy and Wieserma (1993), and Kaplan and Norton (2000). The list in Appendix A.2 contains words describing both overall strategic positioning and the focus of activities in various functions along the value chain depicted by Porter (1985). We search with flexibility for the occurrences of keywords and scale the keyword counts by Item 1 length.

We transform the scaled keyword frequency matrix into a three-dimensional measure using principal component analysis and interpret the factor loadings by examining which keywords load high on each factor and label the factor accordingly. There are two important advantages of using principal component analysis. First, it allows us to aggregate the keywords into three groups with minimum human intervention. It identifies the latent factor based on the correlation structure in the data (Hastie, Tibshirani, and Friedman 2009). Second, the factor-based measure weights keyword counts based on factor loadings rather than applying equal weight to each keyword. Therefore, we can avoid the potential double-counting through highly correlated keywords and correct for the overlapping information. We retain the three factors that have an eigenvalue higher than one and

3 For each document, we identify the Compustat-reported fiscal year end that is closest to (but before) the 10-K filing date and assign the document to the corresponding fiscal year. The average lag between fiscal year end and filing date is 74 days.

4 These industries are highly regulated and the framework of value propositions may not apply.

5 We use wildcards (indicated by asterisk) to capture variations in individual words. In addition, we count the two-word phrases in the form both with and without a hyphen. Finally, we count the instances where phrases that contain a verb and its object that exist in the same sentence without requiring them to be adjacent to each other.

6 To avoid potential bias introduced by further sample selection, we conduct the principal component analysis on the word frequency matrix of the broad sample of 76,306 observations.
rotate the factors with the varimax method for easy interpretation. These three factors capture about 80% of the variance of the original word frequency matrix. Appendix A.2 reports the rotated factor loadings that have an absolute value greater than 0.3. We label the first factor as innovating differentiation (INNO) because keywords load high on factor 1 include innovate, technology, R&D, and proprietary, all of which are closely related to the operations of innovation. Similarly, we label the other two factors as marketing differentiation (MRKT) and cost leadership (COST). Using such a method, we assume that strategic dimensions are not mutually exclusive. Each firm-year observation has values on all three variables. These three variables, INNO, MRKT, and COST are orthogonal to each other and have mean about zero and standard deviation about one by construction. The fact that three factors correspond to the three strategies provides additional validation of the keyword choices.

For further tests to validate the three-dimensional measures, we require sufficient data to construct the dependent variables and control variables. We also restrict the sample to firm-year observations with stock prices greater than $1. Finally, consistent with prior studies, we eliminate observations with the ratio of current period sales to prior period sales below 0.5 or above 2.0 to exclude observations that potentially experienced non-articulating transactions such as mergers and acquisitions or significant divestitures. This final sample contains 52,587 observations and declines to 39,949 if we additionally require one year of lagged data. Table 1 presents the summary statistics of the sample. The variables of interest for our study, INNO, MRKT, and COST, are all continuous variables with mean close to zero and standard deviation close to one by construction. We provide variable definitions in Appendix A.2 and discuss with further details in later sections. All variables are winsorized at the 1% and 99% level.

4. Validation

4.1 Capturing Intra-Industry and Inter-Industry Variations

Our three-dimensional measure allows both intra-industry and inter-industry variation to be examined. Strategy has strong relationships with the environment, which can be viewed as a subtle

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7 Varimax method applies orthogonal rotation and maximizes the variance of the squared loadings within factors (Kaiser 1958). This method minimizes the number of variables that have high loadings on each factor and simplifies the interpretation of the factors.

8 Kim and Mueller (1978) suggest factor loadings of 0.30 as a cutoff for significance.

9 The missing values of R&D and advertising expenses are assigned to be zero.
alignment of business environment and firm resources (Porter 1991; Danny Miller 1987; Hambrick 1983a). Industry characterizes the business environment in terms of product attributes and the degree of competition and induces strategic adaptation. Therefore, strategy does not appear with equal frequency in all industries. For example, firms in dynamic environments are most likely to pursue more innovative strategies than those in stable environments since the performance implication could differ in different environments (Hambrick 1983b). It is, nonetheless, possible for firms in a given industry to follow different strategies since firms essentially attempt to create a unique and valuable position within their industries (Porter 1985).

As evidenced by the summary statistics by industry in Appendix A.4, we observe substantial variation both across and within industries. Combining with Fama and French 48 industry classification, we find top and bottom industry examples based on the means of INNO, MRKT, and COST. Electronic Equipment stands as the top of INNO with an average value of 0.89 and Beer and Liquor as the bottom with -1.00. Apparel strikes as the top of MRKT with 1.28 and Precious Metals as the bottom with -0.60. Construction comes as the top of COST with 0.47 and Pharmaceutical products as the bottom with -0.65. Moreover, the inter-industry variation of the three-dimensional measure is not small. In fact, more than 30 out of 48 industries have a standard deviation beyond 0.5. Overall, these observations add to the face validity of our three-dimensional measure and we further show that inter-industry variation adds significantly to our analysis in Section 5.

4.2 Reliability, Persistence, and Mobility

Another benefit of our three-dimensional measure is to allow observe time series of strategies over a long period. Strategy is recognized as a long-term concept (Porter 1980; Miles et al. 1978). Implementing strategy requires devotion and commitment (Ghemawat 1991). During strategy implementation, firms develop certain sets of response mechanisms and internal consistency over time. Value and resources within the firms are all geared toward the established strategy, causing difficulties accepting the need for and being able to execute changes (Hambrick 1983b). It is also noted that firms with random deviations in strategies will blur their image, fail to develop a clear strategy, and experience low performance (Miles et al. 1978; Porter 1980). Therefore, we assess the test-retest reliability, persistence, and mobility of our measure of strategy and do not expect it to change drastically from year to year. Not surprisingly, we find INNO, MRKT, and COST to be test-
retest reliable, persistent over time, and not very mobile, with COST being the least persistent one among the three.\(^\text{10}\)

First, we use ANOVA estimator to estimate intra-class correlation coefficients (ICC) and examine the test-retest reliably, expecting the measures to consistently reproduce similar values over the sample period. ICC is a ratio of between-firm variance to total variance in the data and theoretically ranges from zero to one, where an ICC of zero indicates no reliability and an ICC of one indicates perfect reliability (Shrout and Fleiss 1979). The ICCs of INNO, MRKT, and COST are 0.78, 0.69, and 0.61, respectively, all above the rules of thumb threshold of good reliability at 0.6 (Cicchetti 1994).

For persistence, we estimate the first-order autoregressive models. We find the AR(1) coefficient for INNO, MRKT, and COST to be 0.93, 0.93, and 0.83, respectively, indicating that the values in year \(t\) are highly correlated with the values in year \(t-1\). Additionally, we present the quintile transition matrix in Appendix A.5. Every year, firms are sorted into five quintiles based on INNO, MRKT, or COST. We find that the three-dimensional measures are quite persistent and yet not constant over the years. The percentage of firms that remain in the same quintile from the previous year to the current year ranges from 68% to 82% for INNO, 57% to 82% for MRKT, and 49% to 75% for COST.\(^\text{11}\) The percentages of firms that remain in the first quintile and the fifth quintile are particularly higher, suggesting that clear and extreme value propositions are more persistent.

Finally, we collapse the transition matrix into single numbers and compute the measures of mobility: the Prais index (\(M_1\)) and the Bartholomew index (\(M_2\)).\(^\text{12}\) The Prais index relies solely on the diagonal elements of the transition matrix and its value lies between 0 and 1. The Bartholomew

\(^{10}\) This is consistent with the argument that cost leadership is not really a viable method to compete and gain sustainable competitive advantage, especially when firms face increasingly uncertain environment over the past decades (Porter 1996).

\(^{11}\) The percentages are smaller and qualitatively consistent when we track the transition matrix over the following three years or five years.

\(^{12}\) We estimate these two mobility measures using the following equations. Let the dimension of the transition matrix (\(P\)) be \(m\) and the elements of the matrix be denoted by \(p_{ij}\), where \(i, j = 1, 2, \ldots, m\).

\[
M_1(P) = \frac{1}{m} \sum_{i=1}^{m} \sum_{j=1}^{m} p_{ij} = 1 - \frac{1}{m} \sum_{i=1}^{m} p_{ii}
\]

\[
M_2(P) = \frac{1}{m(m-1)} \sum_{i=1}^{m} \sum_{j=1}^{m} p_{ij|i-j|}.
\]
index is a mean crossing measure that captures the average number of quintiles crossed by firms and its value depends on the order of the transition matrix. The Bartholomew index ranges from 0 to infinity. Greater values of both measures indicate greater mobility. We find that INNO has the lowest mobility score (0.27 on M_1 and 0.08 on M_2) and COST has the highest mobility score (0.39 on M_1 and 0.13 on M_2), with MRKT being in the middle (0.33 on M_1 and 0.10 on M_2).

4.3 Capturing Time-Series Variation

Although changes in strategies can be rare and painful, prior literature shows that firms have both the desire and the ability to change strategies when it is advantageous to do so (Zajac and Shortell 1989). Our sample firms also show changes in strategies when there are environmental shifts. Figure 1 in Appendix A.6 plots the mean level of INNO, MRKT, and COST for the sample firms over time. Apart from the general increasing trend, there are noticeable drops in INNO and MRKT but not COST from 2000 to 2004 and a slight drop in 2008 and 2009. It is suggested that the burst of the dot-com bubbles and the 2008 financial crisis both might have forced firms to shift away from innovating differentiation and marketing differentiation but not cost leadership. In addition, it seems that the dot-com crash has a bigger impact on value propositions compared to the 2008 financial crisis. One potential reason is that dot-com bubble burst casted greater doubts on how firms operate, made a major change in firms’ expectations about how technology would assist firms to compete, and led to the shuffling of value propositions.

Moreover, we observe the time series of strategies in sample industry sectors. We first consider the IT sector following the shock to the dot-com bubble burst. Figure 2 Panel A-C in Appendix A.7 shows the time trends of INNO, MRKT, and COST for three subindustries in the IT sector: hardware, software, and services. The three subindustries show persistent differences over time. Throughout the years, the hardware industry has the highest average value on INNO and COST and the services industry has the highest on MRKT. We also observe that the dot-com bubble burst hit the three subindustries in similar ways. Hardware, software, and services subindustries all show declines or flattened trends on INNO and MRKT after 2000. We next turn to the supply chain sector to observe the differences between wholesale and retail industries in Figure 3 Panel A-C in Appendix A.8. The wholesale industry focuses more on innovating differentiation compared to the

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13 The graph of our balanced sample (defined as firms with observations from 1995 to 2016) shows similar trends. It suggest that the drops are driven partially by the changes in market composition around the crises and mainly by the firms’ changes in value propositions.
retail industry throughout the sample period. The retail industry focuses more on marketing differentiation compared to the wholesale industry and the difference is increasing. The retail industry used to have a greater focus on cost leadership than the wholesale industry but the situation reversed after 2005 with the trend starting much earlier.

Regulators including SEC and FASB expressed concerns that firms’ disclosure in Form 10-K contains time-series boilerplate (i.e., does not vary time to time) and cross-sectional boilerplate (i.e., not firm-specific) (Lang and Stice-Lawrence 2015; Brown and Tucker 2011). This section partially eases these concerns by documenting the time-series and cross-sectional variations in our measure of strategies that consistent with the expectations. We discuss the comparison with other measures in Appendix A.9.

5. Implications

We now move to assess the construct validity and the implication of our strategy measure. Evidence of construct validity is present when the pattern of correlations among variables conforms to what is predicted by theory (Cronbach 1970; Kerlinger 1966). In this section, we examine the association of strategy with strategic investments, earnings properties, accounting policies, and firm performance as the main tests for construct validity.

5.1 The Influence of Disclosed Strategy on Strategic Investments

Business strategies influence profoundly firm structure through the coordinative, technical, and control tasks they entail (Porter, 1980: 40-41). The focus of their investments also varies. Innovating differentiators devote most of their resources to continuing initiatives on new product development. Marketing differentiators focus relatively heavily on their sales effort to cultivate loyal customer relationships. Cost leaders invest more in modern equipment to improve even further their potential for production efficiency. To assess the impact of disclosed strategy on strategic investments, we estimate the variations on the following regressions:

\[ INV_t = \beta_1 INNO_t + \beta_2 MAKT_t + \beta_3 COST_t + \sum \eta_{1,t} Control_{i,t} + \delta_{j=1}^{48} Ind_j + \delta_{k=1}^{22} Year_k + \varepsilon_t \]  \hspace{1cm} (1)

\[ INV_{t+1} = \beta_1 INNO_t + \beta_2 MAKT_t + \beta_3 COST_t + \beta_4 INV_t + \sum \eta_{1,t} Control_{i,t} + \theta_{j=1}^{48} Ind_j + \delta_{k=1}^{22} Year_k + \varepsilon_t \]  \hspace{1cm} (2)

where \( INV \) is R&D, Adv, or Capex, R&D (Adv or Capex) is calculated as R&D expense (advertising expenditure or capital expenditure) scaled by the average total assets and expressed in
percentage terms. In equation 1, the coefficients estimate the impact of strategy on concurrent strategic investments. In equation 2, these coefficients estimate the incremental impact of strategy on subsequent investments after controlling for concurrent investments. $^{14}$ $\beta_1$, $\beta_2$, and $\beta_3$ are expected to be positive for $R&D$, $Adv$, and $Capex$, respectively. In all the regressions in this and following subsections, we control for generic firm-level and industry-level variables that potentially influence the chosen strategy and investments. We include firm size (defined as logarithm of sales revenue) to control for any potentially confounding effects imposed by wide variations in organizational resources and scope of operations (Dess and Davis, 1984) and firm age (defined as logarithm of the number of years since a firm’s first appearance in Compustat) to proxy for market power and past experience that may limit managerial choices in strategy (Henderson 1993). In addition, we include industry-level variables to capture the business environment firms facing, including the number of industry peers, the average size of industry peers, the size-weighted average age of the industry peers, and industry return on assets. We also include industry fixed effects to tease out constant industry effects and examine the within-industry variations.$^{15}$ In addition, we include year fixed effects to control for common shock across all firms in a year. Here and throughout, all t-statistics are computed with standard errors clustered on firm and year to account for both cross-sectional and temporal dependence.

Table 2 presents the results of regressing the strategic investment variables on the three-dimensional measure using both equations. Consistent with expectations from prior literature, $INNO$ is positive and significant in both concurrent and forward R&D models ($p < 0.01$), $MRKT$ is positive and significant in both concurrent and forward advertising models ($p < 0.01$), and $COST$ is positive and significant in both concurrent and forward CAPEX models ($p < 0.01$). Interestingly, $INNO$ is negative and significant in advertising and CAPEX models, $MRKT$ is negative and significant in R&D models, and $COST$ is negative and significant in R&D and advertising models, suggesting a possibility of firms’ trading off among the strategic investments. The economic significance of the effects is sizable. For example, $Ceteris paribus$, one standard deviation increase in the value of $INNO$ will lead to an increase of about 2.4 in concurrent $R&D$. Such an increase is equivalent to 41% of the mean and 23% of the standard deviation of $R&D$.

$^{14}$ The sample is limited to 42,410 because of the additional requirement on lead data.

$^{15}$ Throughout the paper, we use the Fama and French 48 industry classification.
These coefficient estimates of the three-dimensional measure reveal a striking regularity: firms with different strategies invest in different kinds of activities appropriate for their strategies. The significant association between the measures of strategies and strategic investments also alleviates our concerns of firms making cheap talk in Form 10-K: how firms describe themselves is consistent with how they operate. Moreover, we find that the three-dimensional measure remains to be significant for subsequent strategic investment after controlling for the concurrent investments, especially when these investments are known to be highly serially correlated. It indicates that the textual measures have incremental and perhaps more timely information to explain firms’ operations. It is also consistent with SEC’s requirement on disclosing not only what business has been done but also what is intended to be done in Form 10-K Item 1.

5.2 The Influence of Disclosed Strategy on Earnings Properties

Innovative differentiators commit more resources to long-term investments compared to other firms. Therefore, any changes in strategy or mid-course adjustments can be costly and challenging for innovative differentiators and we expect they have more persistent earnings. We model earnings persistence using first-order autoregressive (AR(1)) model and examine the association between strategy and earnings persistence using the following model. The impact of strategy on earnings persistence is tested by examining whether $\beta_2$, $\beta_3$, and $\beta_4$ are significant.

$$Earnings_{t+1} = \beta_1 Earnings_t + \beta_2 Earnings_t * INNO_t + \beta_3 Earnings_t * MAKT_t + \beta_4 Earnings_t * COST_t + \beta_5 INNO_t + \beta_6 MAKT_t + \beta_7 COST_t + \sum \phi_j Earnings_t * Control_j + \sum \eta_{1,t} Control_{i,t} + \theta_{48} Ind_j + \delta_{22}^{22} Year_k + \epsilon_t$$

(3)

We calculate Earnings as earnings before extraordinary items scaled by average total assets. Following Dechow et al. (2010), we control for firm-specific determinants of earnings properties, including loss (Loss), book leverage (BLev), firm size (Ln(AT)), growth (BTM), and Big 4 auditor (Big4). These firm characteristics are most commonly documented in prior research to be associated with various proxies for earnings properties. Some firm-specific characteristics we control for,

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16 Managers may strategically distort their discussion of the business. For example if managers tend to do cheap talk when the firm is not performing well, then our measure would simply pick up information that is already included in the performance measures. In the robustness test, we control for accounting profitability, stock return, and cash flow from operations, and this has little effect on the magnitude of the coefficients on the three-dimensional measure. Moreover, managers in competitive industries may discuss less than what they actually do. We separate the sample into two based on industry HHI and find our three-dimensional measure remains to be significant in both subsamples. Overall, we find little evidence against our assumption that managers present reasonably accurate discussion of firm business in Item 1.
mediate the association between strategy and earnings properties. Prior literature shows that prospector firms (closely aligned with our product leadership measure) have lower book leverage and lower book-to-market ratio because of greater intangible intensity and higher potential for growth O’Brien (2003). In other words, the inclusion of these controls works against us finding the results we do due to their mediating effects.

Table 3 reports OLS estimates of the relation between strategy and earnings persistence and shows that as expected higher value of INNO is associated with higher earnings persistence ($p < 0.05$), higher value of MAKT is associated with lower earnings persistence ($p < 0.01$), and higher value of COST is associated with lowest earnings persistence ($p < 0.01$). This evidence is consistent with the expectation that innovative differentiators have more persistent earnings. To show that the results of strategy and earnings persistence cannot be explained by omitted time-invariant factors at the industry level and omitted economy-wide factors for every year, we also estimate model (3) after adding the interaction terms of industry fixed effects and $Earnings_t$ and the interaction terms of year fixed effects and $Earnings_t$. Untabulated results support robustness of the significant associations between different business strategies and earnings persistence reported above.

The second earnings property we examine is earnings volatility. Innovative differentiators conduct more outward-looking and exploratory innovations while cost leaders are inward-looking seeking to improve and refine existing operations. Therefore, we expect innovative differentiators to have greater outcome uncertainty and, thus, greater earnings volatility. We examine the association between strategy and earnings volatility using the following model:

$$Vol(Earnings_t) = \beta_1 INNO_t + \beta_2 MAKT_t + \beta_3 COST_t + \sum \eta_{1,t} Control_{i,t} + \theta_{1}^{48} Ind_{j} + \delta_{k=1}^{22} Year_{k} + \epsilon_{t}$$

(4)

where $Vol(Earnings_t)$ is the four-year rolling standard deviation of $Earnings$ for a period from year $t-1$ through $t+2$ and we use the same control variables as in the above-mentioned earning persistence model. We include fixed effects of year and industry to control for time-invariant factors at the industry level and the economy-wide factors that may be correlated with both earnings volatility and the three strategy variables.

Table 4 reports OLS estimates of the relation between strategy and earnings volatility. Column 1 reports the estimates of regressing contemporaneous earnings volatility on strategy
variables, while Column 2 reports the estimates of regressing lead earnings volatility on strategy variables and includes contemporaneous earnings volatility as a control variable. The evidence in Column 1 shows that higher value of INNO is associated with higher earnings volatility ($p < 0.01$), higher value of MAKT is associated with relatively lower earnings volatility ($p < 0.01$), and higher value of COST is associated with the least earnings volatility ($p < 0.01$). This evidence is consistent with the expectation that innovative differentiators have more volatile earnings than other firms do. The OLS estimate in Column 2 shows that strategy variables remain significant ($p < 0.05$), showing the incremental predictive power of strategy on earnings volatility after controlling for contemporaneous earnings volatility.

Overall, the results in Tables 3 and 4 demonstrate that there is a strong relation between strategy and earnings properties as measured by earnings persistence and earnings volatility. The evidence is consistent with the notion that firms with different generic strategies operate differently and show diverging patterns in earnings properties. Furthermore, our analysis underscores the importance of accounting for strategy in studies to understand the behavior of earnings time series under the null hypothesis of no earnings management as suggested by Ball (2013).

5.3 The Influence of Disclosed Strategy on Accounting Policies

In the next set of tests, we examine the association between strategy and accounting policies starting first with income-statement conservatism. As mentioned, innovative differentiators invest more in intangibles such as R&D that are not recognized on the balance sheet. As a result, any bad news associated with those unrecorded assets will not lead to asset impairment and, thus, there will be less observed asymmetry between good news recognition and bad news recognition. Therefore, we expect innovative differentiators to exhibit less observed income-statement conservatism. We model income-statement conservatism using a reverse regression of earnings on return (Basu 1997) and estimate the following model:

$$ E_t/P_{t-1} = \beta_1 DR_t + \beta_2 RET_t + \beta_3 DR_t \ast RET_t + \beta_4 INNO_t + \beta_5 MAKT_t + \beta_6 COST_t + \beta_7 RET_t \ast INNO_t + \beta_8 RET_t \ast MAKT_t + \beta_9 RET_t \ast COST_t + \beta_{10} DR_t \ast RET_t \ast INNO_t + \beta_{11} DR_t \ast RET_t \ast MAKT_t + \beta_{12} DR_t \ast RET_t \ast COST_t + \sum \theta_k Control_k + \sum \phi_j RET_t \ast Control_j + \sum \omega_i DR_t \ast RET_t \ast Control_i + \theta_{48}^{Ind} + \delta_{22}^{Year} + \epsilon_t $$

(5)

where $E_t/P_{t-1}$ represents the earnings per share in year $t$ scaled by stock price at the beginning of the fiscal year. $RET_t$ is the stock return for the 12-month period of fiscal year $t$. $DR_t$ is an indicator
variable equal to one if $RET_t$ is negative and zero otherwise. We control for beginning-of-year $Ln(AT)$, $Lev$, $BTM$, and Litigation risk ($Lit$) (Lafond and Roychowdhury, 2008). Again, we include fixed effects of year and industry to control for potentially omitted fixed factors. Here, $\beta_{10}$, $\beta_{11}$, and $\beta_{12}$ captures the difference in earning response to negative return and to positive return with respect to strategies. We expect a negative estimate on $\beta_{10}$ and a positive estimate on $\beta_{12}$.

Table 5 reports OLS estimates of the relation between strategy and income-statement conservatism. Column 1 reports the estimates without controlling for $BTM$, while Column 2 reports the estimates of the complete model (4). The evidence in Table 4 shows that higher value of INNO is associated with lower income-statement conservatism ($p < 0.01$) and higher value of COST is associated with higher income-statement conservatism ($p < 0.05$). Column 2 shows that $\beta_{10}$, $\beta_{11}$, and $\beta_{12}$ are not statistically significant after controlling for $BTM$, the measure of balance-sheet conservatism. Combining this evidence with that shown in Table 5, we find support for the expectation that innovative differentiators invest heavily in intangibles, leading to higher observed balance-sheet conservatism and, in turn, lower observed income-statement conservatism. This suggests that accounting conservatism measures may be determined by the business strategies and are not a discretionary choice by managers given strategy. Further research on this is likely to be fruitful.

Next, we examine the relation between strategy and revenue-expense matching. Since R&D and advertising activities are generally expensed before the realization of revenues while capital expenditures are recognized as expense over the useful life, we expect innovative differentiators have weaker revenue-expense matching. Following Dichev and Tang (2008), we examine revenue-expense matching using a regression of revenues on one-year-lag, present, and one-year-forward expenses. Containing expense variables of three time periods enables us to control for the strong autocorrelation in expenses and to better identify the dynamic relation between revenues and expenses.

$$Revenue_t = \gamma_0 + \gamma_1 Expense_{t-1} + \gamma_2 Expense_t + \gamma_3 Expense_{t+1} + \epsilon_t$$  \hspace{1cm} (6)

We calculate $Revenue$ as sales revenue scaled by average assets and $Expense$ as total expenses also scaled by average assets, where $Expense$ is sales revenue minus earnings before extraordinary items as in Dichev and Tang. Here $\gamma_2$ captures the matching between revenues and
contemporaneous expenses. Theoretically, $\gamma_2$ ranges from zero to one and the extreme of one indicates perfect matching. The coefficient $\gamma_2$ is associated with strategy variables. We estimate model (6) as follows. We control for size ($\text{Ln}(AT)$), book leverage ($\text{BLev}$), intangible intensity ($\text{BTM}$), loss ($\text{Loss}$), and special item ($\text{SPI}$) as other determinants of matching found in prior literature (e.g., Donelson et al. 2011, Srivastava 2014). Again, we include fixed effects of year and industry to control for potentially omitted fixed factors.

$$
\text{Revenue}_t = \beta_1 \text{Expense}_{t-1} + \beta_2 \text{Expense}_t + \beta_3 \text{Expense}_{t+1} + \beta_4 \text{INNO}_t + \beta_5 \text{MAKT}_t + \beta_6 \text{COST}_t + \beta_7 \text{Expense}_{t-1} \ast \text{INNO}_t + \beta_8 \text{Expense}_{t-1} \ast \text{MAKT}_t + \beta_9 \text{Expense}_t \ast \text{INNO}_t + \beta_{10} \text{Expense}_t \ast \text{MAKT}_t + \beta_{11} \text{Expense}_t \ast \text{COST}_t + \beta_{12} \text{Expense}_t \ast \text{COST}_t + \beta_{13} \text{Expense}_{t+1} \ast \text{INNO}_t + \beta_{14} \text{Expense}_{t+1} \ast \text{MAKT}_t + \beta_{15} \text{Expense}_{t+1} \ast \text{MAKT}_t + \beta_{16} \text{Expense}_{t+1} \ast \text{COST}_t + \beta_{17} \text{Expense}_{t+1} \ast \text{COST}_t + \sum \eta_{1,t} \text{Control}_{t} + \sum \phi_j \text{Expense}_t \ast \text{Control}_j + \sum \omega_i \text{Expense}_{t+1} \ast \text{Control}_i + \theta_{j=1} \text{Ind}_j + \delta_{k=1} \text{Year}_k + \varepsilon_t
$$

(7)

Table 6 reports OLS estimates of the relation between strategy and revenue-expense matching. The evidence in Table 6 shows that as expected higher value of $\text{INNO}$ is associated with weaker revenue-expense matching ($p < 0.01$), higher value of $\text{MAKT}$ is associated with relatively higher revenue-expense matching ($p < 0.01$), and higher value of $\text{COST}$ is associated with the highest (but of course not perfect) revenue-expense matching ($p < 0.01$). This evidence is consistent with the fact that innovative differentiators have more intangible assets expensed before revenue realization than other firms.

To sum up, the results in Tables 5 and 6 demonstrate that there is a strong relation between strategy and accounting policies of conservatism and revenue-expense matching. When firms pursue a certain generic strategy, their decisions on resource allocations and strategic investments comply with their strategy. The differences in strategy manifest in the different consequences of accounting policies. Our tests highlight the importance of including business strategy as an explanatory variable in financial accounting research.

5.4 Explaining Firm Performance with Strategy

The first set of tests in this subsection is to estimate the implication of strategy on DuPont components of accounting profitability (asset turnover and profit margin) using the following regressions:

$$
\text{Component}_t = \beta_1 \text{INNO}_t + \beta_2 \text{MAKT}_t + \beta_3 \text{COST}_t + \sum \eta_{1,t} \text{Control}_{t} + \theta_{j=1} \text{Ind}_j + \delta_{k=1} \text{Year}_k + \varepsilon_t
$$

(8)
Component_{t+1} = \beta_1 INNO_t + \beta_2 MAKT_t + \beta_3 COST_t + \beta_4 INV_t + \\
\sum \eta_{1,t} Control_{1,t} + \theta_{j=1}^{48} Ind_{j} + \delta_{k=1}^{22} Year_{k} + \epsilon_t \tag{9}

where Component is ATO defined as net sales scaled by average total assets, GM defined as gross income scaled by net sales, or OM defined as operating income scaled by net sales. We additionally consider gross margin because the immediate expenses of R&D reduce the operating margin of innovating differentiators and may counteract the inherent ability of innovating differentiators to command a high price premium. In equation 3, the coefficients estimate the impact of strategy on concurrent DuPont components. As discussed, cost leaders and marketing differentiators utilize their assets efficiently and innovating and marketing differentiators command higher margins because of stronger pricing power. Therefore, \beta_2 and \beta_3 are hypothesized to be positive for ATO and \beta_1 and \beta_2 are hypothesized to be positive to GM.

Table 7 presents results from regressing DuPont components on the three-dimensional measure. The positive and significant coefficients for MRKT (p < 0.01) and COST (p < 0.01) for ATO suggest that higher scores on both marketing differentiation and cost leadership are associated with higher asset turnover ratio. These firms utilize assets more efficiently and profit by selling large volumes. For gross margin, the estimated coefficients on INNO (p = 0.11) and MRKT (p < 0.01) are positive, indicating that the higher scores on innovating and marketing differentiation are associated with higher gross margin. For operating margin, the coefficients for MRKT and COST are positive and significant. The coefficient for INNO is no longer as expected positive, potentially because of the accounting treatment to immediately expense R&D investment that accounts for a big proportion of innovating differentiators’ costs. Collectively, these results imply that marketing differentiation and cost leadership profit through selling high volumes and innovating and marketing differentiation profit through their pricing power.

The second set of tests is to explore the average performance implications of strategies over the past two decades. The classic theoretical work predicts that firms with different strategies have similar performance level and those who fail to implement a clear strategy (e.g., firms who stuck in the middle in Porter’s framework and reactors in Miles and Snow’s framework) experience poor performance (Porter 1980; Miles et al. 1978). However, these theories do not explicitly define performance. Therefore, our test on performance implication is exploratory in nature. We use
various performance measures that capture performance from different angles and estimate the variations on the following regression:

\[
\text{Performance}_t = \beta_1 \text{INNO}_t + \beta_2 \text{MAKT}_t + \beta_3 \text{COST}_t + \sum \eta_{1,i} \text{Control}_{i,t} + \theta_{j=1}^{48} \text{Ind}_j + \delta_{k=1}^{22} \text{Year}_k + \epsilon_t
\] (10)

\[
\text{Performance}_{t+1} = \beta_1 \text{INNO}_t + \beta_2 \text{MAKT}_t + \beta_3 \text{COST}_t + \beta_4 \text{INV}_t + \sum \eta_{1,i} \text{Control}_{i,t} + \theta_{j=1}^{48} \text{Ind}_j + \delta_{k=1}^{22} \text{Year}_k + \epsilon_t
\] (11)

Where Performance is ROA defined as earnings before extraordinary items scaled by average total assets, RET defined as 12-month buy-and-hold stock return over the fiscal year, or MtB defined as market value of assets scaled by book value of assets.

Table 8 shows the estimated results of regressing performance on strategy variables. For short-term accounting profitability (ROA), the results in Column I show that INNO is negative and significant \((p < 0.01)\), MRKT is positive and significant \((p < 0.01)\), and COST is not significant, consistent with earlier DuPont analysis. The current accounting treatment of expensing R&D costs immediately may reduce the accounting profitability of innovating differentiators. Marketing differentiators manage to devise their competitive advantage around operating margin and asset turnover, resulting in the highest accounting profitability. For cost leaders, efficient asset utilization does not bring higher accounting profitability. For stock return (RET), the results in Column II show that stock return barely varies with value proposition, suggesting that investors incorporate the implications of value proposition into stock price efficiently. For the market-based measure of firm value that captures long-term prospects (MtB), the positive coefficient of INNO \((p < 0.01)\) and the negative coefficients of MRKT and COST \((p < 0.01)\) in Column III suggest that innovating differentiators have more growth opportunities and greater value in the long run.\(^\text{17}\)

Overall, these results are consistent with the findings in Hambrick (1983a), showing that innovating differentiators experience low concurrent accounting profitability and high growth potential. Stinchcombe (1965) refers the costs of developing new products as “the liability of newness”. These costs not only stem from the development stage of the new products but also from the constant modifications in firms’ operations such as equipment, supplier arrangements, inventories, and sales forces in order to produce and market the new products. The payoff is clear.

\(^{17}\) The coefficients on INNO and COST remain to be significant at one percent level after controlling for strategic investments to account for the influence of accounting treatments.
Innovating differentiators have higher growth potential, especially when their markets readily accepts new products. In Appendix A.10, we show that innovating differentiators have even higher \( MtB \) in high-tech industries.

6. Discussion

A broader set of research questions may be informed by the three-dimensional measure of strategies. Business strategy may influence firms’ operations in many aspects beyond strategic investments. For example, strategy is also likely to influence asymmetric cost behavior because innovating differentiators incur greater adjustment costs than firms with other strategies (Weiss 2010). Strategy may also influence the choice of CEO characteristics such as age, ability, and gender. We find that innovating differentiators have younger CEOs. Analyzing the managerial ability score, we find that innovating differentiators have more capable CEOs (Demerjian et al. 2013). Interestingly, CEO gender and CFO gender are not associated with strategy. Strategy may influence the structure of a CEO compensation contract in its design in terms of reliance on cash or equity payments or its content in terms of its reliance on specific performance measures associated with business strategy. CEO-to-employee pay gap may also vary across firms with different strategies.

The measure can potentially contribute to finance literature as well. Firms with different strategies have different levels of outcome uncertainty with innovating differentiators having the highest. In the face of great outcome uncertainty, innovating differentiators hold financial slack strategically to sustain continuous R&D investments and the competitive advantage of leading innovators, which leads to short-term liquidity and long-term leverage ratios. In addition, great outcome uncertainty does not necessarily translate to high downside risk or bankruptcy risk. innovating differentiators have higher abilities to sustain their competitive advantage over their rivals. This ability, together with the reserved financial slack, brings lower bankruptcy risk to innovating differentiators. Moreover, patterns of cash flow from operations, investing, and financing behaves in a predictable way associated with strategy since cash flow patterns collectively portray firms’ operations during the life cycle of strategy implementation. Finally, the risky R&D investment makes to implement innovating differentiation may impose greater risk on managers.
and lead risk-averse managers to forgo valuable risky investment unless incentive contracts are designed with a higher vega to partially alleviate managers’ aversion to risk.

Looking beyond accounting and finance to strategy area, we conjecture that “strategy synergy” that is to seek firms or managers with similar strategy background would affect the performance of mergers and acquisitions and the performance of incoming executives. We also conjecture that variations across firms in their social responsibility activities are related to business strategy. At a more fundamental level in the study of strategy, performance implications of firms who “stuck-in-the-middle” pursuing both differentiation and cost leadership strategies from Porter’s framework are likely to depend on the relative importance of innovating differentiation and marketing differentiation from the three-dimensional framework considered here.

7. Conclusion
This paper uses text parsing analysis on managerial self-disclosure in regulatory Form 10-K and develops a three-dimensional measure of strategy for a large-sample over 22 years. To ensure content validity, we draw the keyword list from prior literature. Adding to the face validity of the three-dimensional measure, we show that the measure exhibits substantial variation within and across industries. We also find that the measure is persistence over time and has high test-retest reliability but changes around economic shocks, suggesting that firms do directionally adjust their strategies in the face of environmental shifts. Further, we examine construct validity and find that the measure behaves as theory predicts. We find that firms make strategic investments to support the corresponding strategies. The differences in strategy manifest in the different earnings properties and consequences of accounting policies. Moreover, firm performance varies with strategy that is consistent with prior literature.

Our findings span the fields of accounting and strategy and provide evidence that is potentially useful to managers, regulators, and investors, by suggesting the usefulness of managers’ discussion on strategy on Form 10-K. The industry-level analysis of IT and supply chain sectors appeals to an even bigger audience of practitioners. Moreover, our measure should facilitate strategy-related studies of a large number of firms over a long period of time. Research on strategy has been limited to relatively small samples by the lack of reliable measures. Alternatives that have been commonly used in prior research so far have relied on costly means such as surveying senior
executives or eliciting assessments by experts. As mentioned in the discussion section, the textual measure creates many interesting opportunities for future research in accounting, finance, risk management operations, and strategy.

We acknowledge that measuring strategy is an ambitious task. We view our present study as only the first step in this pursuit by helping us understand how strategy drives a firm's strategic investments and operating activities. We have relied on theoretical implications of strategies at a high level of abstraction to enable comparisons across firms but may not necessarily capture the full set of detailed cause-effect hypotheses firms make about the implementation of their strategy. While this study seeks to incorporate both strategic positioning and strategy implementation in the keyword list to measure strategy, future studies will further refine the detailed measurement and the implementation to advance our understanding.
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| VARIABLES       | Mean | S.D.  | P25  | P50  | P75  |
|-----------------|------|-------|------|------|------|
| INNO            | -0.00| 0.86  | -0.69| -0.15| 0.54 |
| MRKT            | 0.08 | 0.85  | -0.50| -0.16| 0.41 |
| COST            | 0.06 | 0.79  | -0.46| -0.07| 0.42 |
| R&D             | 4.97 | 9.17  | 0.00 | 0.20 | 6.35 |
| Adv             | 1.32 | 3.41  | 0.00 | 0.00 | 0.78 |
| Capex           | 5.43 | 5.96  | 1.76 | 3.49 | 6.69 |
| Earnings        | 0.01 | 0.16  | -0.01| 0.04 | 0.09 |
| Vol(Earnings)   | 0.07 | 0.09  | 0.02 | 0.04 | 0.09 |
| Revenue         | 1.20 | 0.79  | 0.65 | 1.03 | 1.53 |
| Expense         | 1.19 | 0.77  | 0.65 | 1.02 | 1.50 |
| DR              | 0.43 | 0.49  | 0.00 | 0.00 | 1.00 |
| ATO             | 1.19 | 0.80  | 0.64 | 1.03 | 1.54 |
| Gmargn          | 0.33 | 0.53  | 0.23 | 0.36 | 0.53 |
| OPmargn         | -0.09| 0.84  | 0.01 | 0.07 | 0.13 |
| ROA             | 0.04 | 0.17  | 0.01 | 0.07 | 0.13 |
| RET             | 0.19 | 0.72  | -0.22| 0.06 | 0.39 |
| MtB             | 2.03 | 1.52  | 1.14 | 1.54 | 2.29 |
| Firm Size       | 5.84 | 2.02  | 4.42 | 5.83 | 7.22 |
| Firm Age        | 2.75 | 0.74  | 2.20 | 2.71 | 3.33 |
| BTM             | 0.55 | 0.50  | 0.25 | 0.44 | 0.73 |
| Lev             | 0.20 | 0.20  | 0.01 | 0.16 | 0.32 |
| Loss            | 0.28 | 0.45  | 0.00 | 0.00 | 1.00 |
| Big4            | 0.81 | 0.39  | 1.00 | 1.00 | 1.00 |
| Lit             | 0.22 | 0.41  | 0.00 | 0.00 | 0.00 |
| SPI             | 0.34 | 0.47  | 0.00 | 0.00 | 1.00 |
| No. of Industry Peers | 404.53 | 370.22 | 134.00 | 272.00 | 529.00 |
| Average Peer Size | 4.93  | 0.99  | 4.13 | 4.88 | 5.60 |
| Industry HHI    | 0.06 | 0.04  | 0.03 | 0.05 | 0.08 |
| Industry Age    | 2.47 | 0.30  | 2.27 | 2.45 | 2.69 |
| Industry ROA    | -1.23| 2.48  | -1.26| -0.36| -0.10|

All continuous variables are winsorized at the extreme one percent level. The sample size is 52,587 observations for 4,390 unique firms from 1995 to 2016.
**TABLE 2 STRATEGIC INVESTMENTS**

| VARIABLES       | (1)       | (2)       | (3)       | (4)       | (5)       | (6)       |
|-----------------|-----------|-----------|-----------|-----------|-----------|-----------|
|                 | $R&D_t$   | $R&D_{t+1}$ | $Adv_t$  | $Adv_{t+1}$ | $Capex_t$ | $Capex_{t+1}$ |
| **INNO_t**      | 2.694***  | 0.245***  | -0.221*** | -0.034***  | -0.191**  | -0.090**  |
|                 | (0.00)    | (0.00)    | (0.00)    | (0.03)    | (0.04)    |           |
| **MRKT_t**      | -0.953*** | -0.055**  | 0.683***  | 0.039***  | -0.104    | 0.002     |
|                 | (0.00)    | (0.01)    | (0.00)    | (0.00)    | (0.15)    | (0.95)    |
| **COST_t**      | -0.527*** | -0.053*** | -0.371*** | -0.036*** | 0.327***  | 0.091***  |
|                 | (0.00)    | (0.01)    | (0.00)    | (0.00)    | (0.00)    |           |
| **Firm Size_t** | -0.890*** | -0.103*** | 0.018     | -0.002    | 0.107***  | -0.004    |
|                 | (0.00)    | (0.00)    | (0.42)    | (0.59)    | (0.00)    | (0.65)    |
| **Firm Age_t**  | -0.737*** | -0.076*** | -0.167**  | -0.019*   | -0.755*** | -0.065    |
|                 | (0.00)    | (0.12)    | (0.01)    | (0.05)    | (0.00)    | (0.14)    |
| **No. of Industry Peers_t** | 0.005*** | 0.000     | 0.000     | 0.000     | 0.000     | 0.000     |
|                 | (0.00)    | (0.00)    | (0.12)    | (0.84)    | (0.38)    | (0.71)    |
| **Average Peer Size_t** | 0.508*  | 0.149     | 0.108     | -0.036    | 0.463**   | -0.055    |
|                 | (0.07)    | (0.13)    | (0.26)    | (0.33)    | (0.03)    | (0.69)    |
| **Industry HHI_t** | 2.138     | -0.004    | -1.398    | -0.253    | 2.478     | 1.361     |
|                 | (0.43)    | (0.99)    | (0.23)    | (0.49)    | (0.24)    | (0.35)    |
| **Industry Age_t** | 0.884     | -0.208    | 0.676***  | -0.032    | -1.417**  | -0.899**  |
|                 | (0.19)    | (0.38)    | (0.01)    | (0.70)    | (0.02)    | (0.04)    |
| **Industry ROA_t** | -0.036*** | 0.006     | 0.006***  | 0.001     | -0.022    | -0.008    |
|                 | (0.00)    | (0.60)    | (0.00)    | (0.51)    | (0.24)    | (0.52)    |
| **R&D_t**       |           |           |           |           |           |           |
|                 |           |           |           |           |           |           |
| **Adv_t**       |           |           | 0.922***  |           |           |           |
|                 |           |           | (0.00)    |           |           |           |
| **Capex_t**     |           |           |           |           |           |           |
|                 |           |           |           |           |           | 0.678***  |
|                 |           |           |           |           |           | (0.00)    |

This table reports OLS estimates on regressing strategic investment activities on strategy. The numbers in parentheses are p-value and we cluster standard errors by firm and year with *, **, and *** indicating significance at the 10%, 5%, and 1% levels, respectively, in two-tailed tests. Industry fixed effects are based on the Fama and French 48 sectors. All other variables are defined in Appendix A.3.
TABLE 3 EARNINGS PERSISTENCE

| VARIABLES          | (I)       |
|--------------------|-----------|
|                   | \(Earnings_{t+1}\) |
| \(Earnings_t\)    | 0.958***  |
|                   | (0.000)   |
| \(INNO_t\)        | -0.009*** |
|                   | (0.000)   |
| \(MAKT_t\)        | 0.005***  |
|                   | (0.001)   |
| \(COST_t\)        | 0.004***  |
|                   | (0.001)   |
| \(Earnings_t \ast \ INNO_t\) | 0.028**  |
|                   | (0.041)   |
| \(Earnings_t \ast \ MAKT_t\) | -0.047*** |
|                   | (0.002)   |
| \(Earnings_t \ast \ COST_t\) | -0.071*** |
|                   | (0.000)   |
| \(Loss_t\)        | -0.022*** |
|                   | (0.000)   |
| \(Lev_t\)         | -0.023*** |
|                   | (0.007)   |
| \(Firm Size_t\)   | 0.008***  |
|                   | (0.000)   |
| \(BTM_t\)         | -0.036*** |
|                   | (0.000)   |
| \(Big4_t\)        | -0.002    |
|                   | (0.462)   |
| \(Earnings_t \ast \ Loss_t\) | -0.041  |
|                   | (0.361)   |
| \(Earnings_t \ast \ Lev_t\) | -0.168*** |
|                   | (0.001)   |
| \(Earnings_t \ast \ Firm Size_t\) | -0.044*** |
|                   | (0.001)   |
| \(Earnings_t \ast \ BTM_t\) | -0.175*** |
|                   | (0.000)   |
| \(Earnings_t \ast \ Big4_t\) | -0.036  |
|                   | (0.126)   |

Ind FE          | YES       |
Year FE         | YES       |
Observations    | 40,748    |
Adjusted R-squared | 0.556   |

This panel reports OLS regression estimates of regressing earnings persistence on strategy. The numbers in parentheses are p-value and we cluster standard errors by firm and year with *, **, and *** indicating significance at the 10%, 5%, and 1% levels, respectively, in two-tailed tests. Industry fixed effects are based on the Fama and French 48 sectors. All other variables are defined in Appendix A.3.
TABLE 4 EARNINGS VOLATILITY

| VARIABLES | (I)          | (II)          |
|-----------|--------------|---------------|
|           | Vol(Earnings) | Vol(Earnings) |
| \(INNO_t\) | 0.007***     | 0.001*        |
|           | (0.000)      | (0.057)       |
| \(MAKT_t\) | -0.004***    | -0.001**      |
|           | (0.001)      | (0.025)       |
| \(COST_t\) | -0.004***    | -0.001**      |
|           | (0.000)      | (0.033)       |
| \(Loss_t\) | 0.058***     | 0.013***      |
|           | (0.000)      | (0.000)       |
| \(Lev_t\) | 0.001        | -0.005**      |
|           | (0.894)      | (0.030)       |
| \(Firm Size_t\) | -0.012***  | -0.002***    |
|           | (0.000)      | (0.000)       |
| \(BTM_t\) | -0.017***    | -0.001        |
|           | (0.000)      | (0.290)       |
| \(Big4_t\) | 0.001        | -0.000        |
|           | (0.536)      | (0.867)       |
| \(Vol(Earnings)_t\) |             | 0.762***     |
|           |              | (0.000)       |

Ind FE | YES | YES
Year FE | YES | YES
Observations | 40,748 | 33,779
Adjusted R-squared | 0.275 | 0.691

This panel reports OLS regression estimates of regressing earnings volatility on strategy. The numbers in parentheses are p-value and we cluster standard errors by firm and year with *, **, and *** indicating significance at the 10%, 5%, and 1% levels, respectively, in two-tailed tests. Industry fixed effects are based on the Fama and French 48 sectors. All other variables are defined in Appendix A.3.
| VARIABLES          | (1)         | (2)         |
|-------------------|-------------|-------------|
|                  | $Et/P_{t-1}$| $Et/P_{t-1}$|
| $DR_t$            | -0.001      | 0.007       |
|                   | (0.782)     | (0.104)     |
| $RET_t$           | 0.056***    | 0.090***    |
|                   | (0.000)     | (0.000)     |
| $DR_t*RET_t$      | -0.109***   | -0.257***   |
|                   | (0.002)     | (0.000)     |
| $INNO_t$          | -0.004**    | 0.000       |
|                   | (0.035)     | (0.917)     |
| $MRKT_t$          | -0.002      | -0.002      |
|                   | (0.204)     | (0.199)     |
| $COST_t$          | 0.003**     | -0.001      |
|                   | (0.046)     | (0.557)     |
| $RET_t*INNO_t$    | -0.001      | -0.006**    |
|                   | (0.782)     | (0.046)     |
| $RET_t*MRKT_t$    | 0.003       | 0.004**     |
|                   | (0.103)     | (0.019)     |
| $RET_t*COST_t$    | -0.006**    | -0.002      |
|                   | (0.045)     | (0.471)     |
| $DR_t*RET_t*INNO_t$| -0.024**   | 0.005       |
|                   | (0.015)     | (0.534)     |
| $DR_t*RET_t*MRKT_t$| -0.009     | -0.010      |
|                   | (0.215)     | (0.121)     |
| $DR_t*RET_t*COST_t$| 0.019**    | -0.002      |
|                   | (0.029)     | (0.727)     |
| $Lev_t$           | -0.005      | 0.011       |
|                   | (0.528)     | (0.184)     |
| $Firm Size_t$     | 0.001       | 0.001       |
|                   | (0.505)     | (0.206)     |
| $Loss_t$          | -0.006      | 0.003       |
|                   | (0.157)     | (0.518)     |
| $Lit_t$           | -0.183***   | -0.189***   |
|                   | (0.000)     | (0.000)     |
| $BTM_t$           | 0.054***    | 0.054***    |
|                   |             |             |
| $RET_t*Lev_t$     | 0.018*      | -0.003      |
|                   | (0.086)     | (0.812)     |
| $RET_t*Firm Size_t$| -0.004**   | -0.004*     |
|                   | (0.031)     | (0.058)     |
| $RET_t*Loss_t$    | 0.014**     | 0.002       |
|                   | (0.018)     | (0.764)     |
| $RET_t*Lit_t$     | -0.112***   | -0.104***   |
|                   | (0.000)     | (0.000)     |
| $RET_t*BTM_t$     | -0.031***   | -0.031***   |
|                   |             |             |
| $DR_t*RET_t*Lev_t$| 0.097***    | 0.204***    |
|                   | (0.004)     | (0.000)     |
This panel reports OLS regression estimates of regressing income-statement conservatism on strategy. The numbers in parentheses are p-value and we cluster standard errors by firm and year with *, **, and *** indicating significance at the 10%, 5%, and 1% levels, respectively, in two-tailed tests. Industry fixed effects are based on the Fama and French 48 sectors. All other variables are defined in Table 1.

| Term | Coefficient | Std. Error | Coefficient | Std. Error |
|------|-------------|------------|-------------|------------|
| $DR_t \times RET_t \times Firm\ Size_t$ | 0.014** | 0.011 | 0.011** | 0.046 |
| | (0.011) | | (0.011) | |
| $DR_t \times RET_t \times Loss_t$ | -0.040** | 0.013 | 0.024 | 0.145 |
| | (0.013) | | (0.013) | |
| $DR_t \times RET_t \times Lit_t$ | 0.225*** | (0.000) | 0.162*** | (0.000) |
| | | | | |
| $DR_t \times RET_t \times BTM_t$ | 0.354*** | (0.000) | | |

Ind FE | YES | YES |
Year FE | YES | YES |
Observations | 40,748 | 40,748 |
Adjusted R-squared | 0.451 | 0.489 |
### TABLE 6 MATCHING OF REVENUE AND EXPENSES

| VARIABLES             | (1)          |
|-----------------------|-------------|
|                       | Revenue$_t$ |
| Expense$_{t-1}$       | 0.082*      |
|                       | (0.091)     |
| Expense$_t$           | 0.918***    |
|                       | (0.000)     |
| Expense$_{t+1}$       | -0.031      |
|                       | (0.447)     |
| INNO$_t$              | 0.003       |
|                       | (0.418)     |
| MRKT$_t$              | 0.004       |
|                       | (0.378)     |
| COST$_t$              | 0.003       |
|                       | (0.402)     |
| Expense$_{t-1}$* INNO$_t$ | 0.043***  |
|                       | (0.007)     |
| Expense$_{t-1}$* MRKT$_t$ | -0.017*   |
|                       | (0.051)     |
| Expense$_{t-1}$* COST$_t$ | -0.044*** |
|                       | (0.001)     |
| Expense$_t$* INNO$_t$  | -0.048**    |
|                       | (0.015)     |
| Expense$_t$* MRKT$_t$  | 0.047***    |
|                       | (0.000)     |
| Expense$_t$* COST$_t$  | 0.059***    |
|                       | (0.001)     |
| Expense$_{t+1}$* INNO$_t$ | -0.011     |
|                       | (0.457)     |
| Expense$_{t+1}$* MRKT$_t$ | -0.022*** |
|                       | (0.007)     |
| Expense$_{t+1}$* COST$_t$ | -0.013     |
|                       | (0.248)     |
| Loss$_t$              | -0.188***   |
|                       | (0.000)     |
| Lev$_t$               | -0.051***   |
|                       | (0.002)     |
| Firm Size$_t$         | 0.008***    |
|                       | (0.000)     |
| BTM$_t$               | -0.008      |
|                       | (0.105)     |
| SPI$_t$               | -0.007      |
|                       | (0.161)     |
| Expense$_{t-1}$*Loss$_t$ | 0.061**    |
|                       | (0.043)     |
| Expense$_{t-1}$*Lev$_t$ | 0.072      |
|                       | (0.174)     |
| Expense$_{t-1}$* Firm Size$_t$ | -0.004     |
|                       | (0.633)     |
| Expense$_{t-1}$*BTM$_t$ | -0.049**   |
|                       | (0.383)     |
| Variable          | Coefficient | P-value |
|-------------------|-------------|---------|
| Expense<sub>t</sub>*SPI<sub>t</sub> | 0.086*** | (0.001) |
| Expense<sub>t</sub>*Loss<sub>t</sub> | -0.221*** | (0.000) |
| Expense<sub>t</sub>*Lev<sub>t</sub> | -0.082 | (0.471) |
| Expense<sub>t</sub>*Firm Size<sub>t</sub> | 0.008 | (0.501) |
| Expense<sub>t</sub>*BTM<sub>t</sub> | 0.079** | (0.011) |
| Expense<sub>t</sub>*SPI<sub>t</sub> | -0.133*** | (0.001) |
| Expense<sub>t+1</sub>*Loss<sub>t</sub> | 0.131*** | (0.000) |
| Expense<sub>t+1</sub>*Lev<sub>t</sub> | -0.003 | (0.967) |
| Expense<sub>t+1</sub>*Firm Size<sub>t</sub> | -0.002 | (0.752) |
| Expense<sub>t+1</sub>*BTM<sub>t</sub> | -0.016 | (0.366) |
| Expense<sub>t+1</sub>*SPI<sub>t</sub> | 0.046** | (0.040) |

Ind FE | YES
Year FE | YES
Observations | 40,748
Adjusted R-squared | 0.971

This panel reports OLS regression estimates of regressing matching on strategy. The numbers in parentheses are p-value and we cluster standard errors by firm and year with *, **, and *** indicating significance at the 10%, 5%, and 1% levels, respectively, in two-tailed tests. Industry fixed effects are based on the Fama and French 48 sectors. All other variables are defined in Table 1.
## TABLE 7 DUPONT ANALYSIS

| VARIABLES              | (1)  | (2)  | (3)  |
|------------------------|------|------|------|
|                        | $ATO_t$ | $Gmargint$ | $OPmargint$ |
| **INNO_t**             | -0.066*** | 0.013 | -0.044*** |
|                        | (0.00)     | (0.11) | (0.00)     |
| **MRKT_t**             | 0.082***  | 0.032*** | 0.051***  |
|                        | (0.00)     | (0.00) | (0.00)     |
| **COST_t**             | 0.095***  | -0.025*** | 0.009     |
|                        | (0.00)     | (0.00) | (0.11)     |
| **Firm Size_t**        | 0.028***  | 0.056*** | 0.155***  |
|                        | (0.00)     | (0.00) | (0.00)     |
| **Firm Age_t**         | 0.018     | -0.010  | 0.019     |
|                        | (0.18)     | (0.17)  | (0.14)     |
| **No. of Industry Peers_t** | 0.000  | -0.000  | -0.000*** |
|                        | (0.15)     | (0.37)  | (0.01)     |
| **Average Peer Size_t**| -0.002    | -0.034  | -0.026    |
|                        | (0.94)     | (0.13)  | (0.42)     |
| **Industry HHI_t**     | -0.153    | -0.395** | 0.089     |
|                        | (0.53)     | (0.02)  | (0.73)     |
| **Industry Age_t**     | 0.041     | 0.103** | 0.179**   |
|                        | (0.42)     | (0.04)  | (0.03)     |
| **Industry ROA_t**     | -0.001    | 0.001   | 0.000     |
|                        | (0.38)     | (0.64)  | (0.84)     |
| Observations           | 52,587     | 52,587  | 52,587     |
| Adjusted R-squared     | 0.335      | 0.164   | 0.271      |
| Industry FE            | YES        | YES     | YES        |
| Year FE                | YES        | YES     | YES        |

This table reports OLS estimates on regressing DuPont components on strategy. The numbers in parentheses are p-value and we cluster standard errors by firm and year with *, **, and *** indicating significance at the 10%, 5%, and 1% levels, respectively, in two-tailed tests. Industry fixed effects are based on the Fama and French 48 sectors. All other variables are defined in Appendix A.3.
This table reports OLS estimates on regressing performance measures on strategy. The numbers in parentheses are p-value and we cluster standard errors by firm and year with *, **, and *** indicating significance at the 10%, 5%, and 1% levels, respectively, in two-tailed tests. Industry fixed effects are based on the Fama and French 48 sectors. All other variables are defined in Appendix A.3.