The Competitor Tracking Paradox

Ronald C. Anderson[a], Keith D. Brouthers[b], and David M. Reeb[c]

[a]*Kogod School of Business, American University, Washington, DC 20016*
[b]*College of Management, North Carolina State University, Raleigh, NC 27695*
[c]*Fox School of Business, Temple University, Philadelphia, PA 19122*

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Abstract

The academic and general press indicates that competitor tracking represents a fundamental and necessary task for firms to retain their competitive advantage and to sustain future performance. Yet, various stakeholders in the firm may have differing pecuniary incentives for corporate competitor tracking. We posit that corporate insiders and creditors exposure to firm-specific risk provides these stakeholders with strong incentives to encourage competitor tracking by the firm. Diversified shareholders however, can maintain stakes across the entire industry or market indicating that firm-specific competitive threats have little bearing on these stakeholders. Consistent with these hypotheses our empirical results suggest that stakeholders exposed to greater levels of firm-specific risk appear to place greater emphasis on competitor tracking. Further results indicate that outside shareholders routinely discount firms that engage in excess competitor tracking, even in high R&D firms. However, in industries where there is greater potential for firms to coordinate their activities to increase total industry profits, outside shareholders place a premium on corporate competitor tracking.

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Business scholars observe that firm success relies on managers accurately assessing and identifying the long-term threats posed by their corporate rivals (Porter, 1980, 1998). Peteraf and Bergman (2003) posit that managers in developing their strategic choices should consider their competitors' operational plans and business decisions. Others describe how the process of bringing economically profitable products to market requires managers to understand and be cognizant of their rivals' future products (Zajac and Bazerman, 1991). Prior research however, indicates that managers' are often unable to identify their key rivals because of managerial hubris, bounded rationality, or cognitive limitations (Ng, Westergren and Sonka, 2009; Peteraf and Bergen, 2003; Porac et al., 1995; Zajac and Bazerman, 1991). Others suggest that these limitations result in firms focusing on local competitors (Porac et al., 1989; Pouder and St. John, 1996) or following firms that share similar attributes, customers, or resources (Bergen and Peteraf, 2002; Chen, 1996; Clark and Montgomery, 1999; Markman, Gianiodis and Buchholtz, 2009; Peteraf and Bergen, 2003; Porac and Thomas, 1990; Porac et al., 1995). Although managers can have difficulty in assessing their corporate rivals, the academic literature and the popular press generally indicate that competitor tracking represents a fundamental element in firms' long-term success (Chen, 1996).

The identification and monitoring of rivals (which we term as "tracking") however, is a costly and complex undertaking that requires a substantial investment by the firm in financial resources and managerial effort (Porac and Thomas, 1990). Fehringer (2007) finds that about one-third of firms maintain dedicated competitive analysis units, while firms such as Microstrategy, IBM Cognos, and SAP sell dedicated software for tracking and compiling data on corporate competitors. Fuld and Company, in their Global Benchmark Study from June 2007, stress that the firms comprising the Fortune 1000 will spend over $1 billion on simply staffing competitor tracking and analysis units, with additional expenditures on computer systems, databases, and external

consultants. Managers devote substantial time, energy, and effort in interpreting and analyzing this information (Balakrishnan and Wernerfelt, 1985).

In this analysis, we approach the issue from a different perspective and note an important paradox concerning investments in competitor tracking. Specifically, we argue that the firm's different stakeholders maintain different views and attitudes towards competitor tracking because of the costs involved and because the potential benefits are not uniformly shared. Our theory suggests that the undiversified nature of managerial human and financial capital, family shareholders' concentrated ownership stakes, and creditor concerns with capital recovery provide these stakeholders with strong incentives to ensure firm survival. Managers, family owners, and creditors can increase the likelihood of firm survival by mitigating the risks arising from firm-specific competitive threats. Diffuse outside shareholders however arguably hold little idiosyncratic risk within their portfolios. Diversified shareholders can maintain stakes across the entire industry or market indicating that firm-specific competitive threats have little bearing on these stakeholders. Consequently, corporate insiders and creditors exposure to firm-specific risk induces these stakeholders to place a greater emphasis on competitor tracking than outside shareholders. One implication is that firms' placing a heavy emphasis on competitor tracking in order to mitigate default risk provides benefits to many of the firm's stakeholders at the expense of outside shareholders.

Our empirical analysis provides support for the notion that the firm's stakeholders place differing emphasis on the importance of competitor tracking. Specifically, we find that several stakeholders (managers, creditors, and concentrated shareholders) place a significant emphasis on tracking rivals; firms with a presence of these stakeholders tend to track more competitors relative to their peers. Yet, outside shareholders, on average, significantly discount or penalize firms that engage in this excess competitor tracking. The results provide evidence consistent with the

argument that inside and concentrated stakeholders use excess competitor tracking as a tool or mechanism to mitigate corporate default risk. However, as Berger and Ofek (1996) note, outside shareholders appear to exhibit little concern with corporate default risk because they can eliminate this risk by holding a diversified portfolio of securities. Thus, if the firm's objective is to maximize shareholder wealth, then our results suggest that inside and concentrated stakeholders extract private benefits from the firm through excess competitor tracking at the expense of outside shareholders. In contrast, if firms maintain an objective of advancing the collective interests of stakeholders (e.g. maximize the discounted value of future profits), then these results suggest that excess competitor tracking facilitates this process by reducing firm risk.

Although the results provide evidence consistent with our theoretical argument on differential stakeholder preferences for extensive competitor tracking, on first appearance they do not align well with conventional wisdom. In particular, a common belief suggests that competitor tracking represents an essential component of firm survival and shareholder value creation; indicating that shareholders should highly value competitor tracking. On average however, we find that excess tracking appears to harm outside shareholders. To gain further insights into this issue, we examine two situations where shareholders are perhaps more likely to benefit from competitor tracking. First, extensive competitor tracking may play a particularly important role in R&D intensive firms to avoid unsuccessful research paths and to improve complementariness of R&D investments (Henderson and Cockburn, 1996). Second, we explore a situation where competitive tracking may improve total industry profits by facilitating coordination by firms in the marketplace. A large theoretical literature suggests that firms are more likely to engage in collusion when they can monitor their rivals and discover cost or pricing information (Athey and Bagwell, 2001; Bresser, 1988). In more concentrated industries, extensive competitor tracking may facilitate collusion and improve firm and industry performance. Although we find that outside shareholders continue to

discount R&D intensive firms for excess competitor tracking, we find strong support for the argument that outside shareholders derive benefits from excess competitor tracking in industries providing a greater potential for collusive activity. These results suggest excess competitor tracking enhances shareholder wealth in situations where it improves total industry profitability.

This study extends prior research along two important avenues. First, our analysis broadens the literature suggesting managerial biases and myopia influence competitor tracking (Peteraf and Bergen 2003; Porac and Thomas, 1990; Zajac and Bazerman, 1991) by considering the potential for differing preferences for tracking rivals amongst differing stakeholders. Our study thus contributes to the literature by suggesting that the firm's various stakeholders place differing emphasis on competitor tracking and do not uniformly share the benefits or costs of this activity, even if it benefits the firm as a whole. While prior literature indicates that bounded rationality creates competitor blindspots (Clark and Montgomery, 1999; Porac et al., 1995; Zajac and Bazerman, 1991), our analysis suggests that these blindspots may actually be created by conflicting pressures managers face regarding the decision to invest (or not) in competitor tracking.

Second, our analysis extends the literature by considering how the underlying financial basis for competitor tracking may influence the activities of various stakeholders in the firm. Management research has developed a rich body of theory on strategic decision-making derived from differing perspectives, including Porter's (1980) competitive strategy and Jensen and Meckling's (1976) agency theory. The industrial organization based competitive-advantage literature rests on economic models that focus on maximizing the present value of the firm's future profits. In contrast, agency theory is based on the notion of maximizing the wealth of diversified shareholders. Although these two decision rules often suggest similar strategic choices, our analysis indicates that the competitor tracking decision is, in many cases, not one of these choices. Thus, our investigation extends the fundamental arguments for competitor tracking by considering how

different decision rules potentially lead to conflicting strategic decisions. Consistent with the argument that rival monitoring enhances firm survival (Porter, 1980), our study suggests mitigation or reduction of firm default risk appears to be a key driver or incentive for managers (or firms) to engage in competitor tracking.

Theory and Hypotheses

Our analysis starts with the recognition that differing concerns over firm-survival (Eisenhardt, 1989) may influence attitudes towards rival identification. Research indicates that tracking corporate rivals enhances or expands firms' growth opportunities, thus reducing firm-specific risk (Porter, 1980). Firm-specific risk is created by the rivalry between competitors that influences the distribution of market share in a particular industry (Porter, 1998). As firms compete, customer buying behavior shifts, thus changing the demand for firms' products and services. For example products like Sony's Walkman that dominated the portable music market, quickly lost market share to Apple Computer's iPod as consumers changed the way they purchased music. Because of the uncertain nature of this rivalry, firms take steps to assure their continued survival.

Investments in competitor tracking can reduce firm-specific risk and increase firm survival through several mechanisms. First, tracking helps reduce the occurrence of strategic surprises (Bergen and Peteraf, 2002). Strategic surprises occur when new or existing competitors introduce products or services that decrease the market share of the focal firm's products or services, or makes them obsolete. In this case, the focal firm may be forced to react to protect their market, often by acquiring another firm with expertise in the new product/service area (Amihud and Lev, 1981). In other circumstances, strategic surprises lead to substantial losses or even firm failure; resulting in stakeholders potentially forfeiting their investment.

Second, tracking competitors can lead to new or expanded opportunities for the firm and increase the probability of firm survival. New products and services represent an important determinant of firms' growth and long-term financial performance (Pauwels, et al. 2004). Without these new and improved products and services, firms would eventually shrink in size and fail as competitive or substitute products gain market share (Yli-Renko and Janakiraman, 2008). Yet, bringing profitable new products to market requires managers to understand and be cognizant of their rivals' future products (Zajac and Bazerman, 1991). Furthermore, failing to track corporate rivals may lead to missed opportunities because the firm can become blind to alternative avenues through which their advantages can be exploited (Bergen and Peteraf, 2002). Identifying and tracking each of the firm's rivals facilitates new product development and new market opportunities, thus enhancing corporate survival and stakeholder value creation.

Finally competitor tracking can help firms maintain the status quo; providing a mechanism to balance the competitive activities of rivals while maintaining the firm's position in the marketplace. Sterman et al. (2007) suggest that rival tracking improves firms' forecasts of industry-wide demand, allowing firms to better estimate their own output and avoid situations of over production. Without accurate forecasts, firms may pursue employment and production strategies that lead to the accumulation of slack resources adversely impacting firm performance and survival. Poor demand forecasting also can lead to excess inventories, storage and holding costs that threatens firms' financial well-being. By tracking more competitors, firms can improve planning and resource usage, minimizing the threat to survival, and maintain their market position.

The risk perspective builds on the notion that competitor tracking enhances firm survival by reducing opportunities for rivals to appropriate market share, rather than increasing total industry profits. Consequently, diversified shareholders, who can simply purchase shares of all firms in the industry (Berger and Ofek, 1996), may view rival tracking costs as wasteful because they can achieve

these benefits on their own. More specifically, shareholders who hold the market-wide portfolio may well be indifferent about which particular firms are successful (Amihud and Lev, 1981), unless it somehow improves the total size of the market (Fosfuri and Giarratana, 2009).

Finance literature indicates that shareholders can eliminate nearly half the risk of holding an individual stock by instead, holding a diversified portfolio or broad basket of stocks (Anderson and Reeb, 2003). Diversification eliminates firm-specific risk that arises from project failure, market share losses, or managerial error. Consequently, outside shareholders may view cash outlays to develop systems to track competitors in order to minimize losing market-share as providing limited benefits since they can replicate this on their own (see appendix A for an illustrative example). By holding the target firm as well as its rivals, diffuse shareholders potentially eliminate or limit firm-specific competitive risks. Therefore, diversified shareholders may show little concern with competitor tracking because they can eliminate the risk created by individual competitors through diversification.

Corporate Insiders and Firm Risk

Contrary to diversified shareholders, corporate insiders and concentrated stakeholders may possess strong incentives to reduce firm risk so as to ensure firm survival. To mitigate firm risk, these stakeholders encourage or prompt the firm to intensely scan the competitive landscape to assess threats arising from rivals' products and services. For example, relative to diversified shareholders, managers arguably possess strong incentives to reduce firm-specific risk. For many managers, human capital constitutes their largest asset and this asset generally represents an undiversified investment in a single firm (Amihud and Lev, 1981), focusing managerial attention on firm survival. Older executives arguably develop greater firm specific knowledge and their networks within the firm become deeper and broader as they remain on the job, potentially enhancing

concerns about corporate failure. Employment switching-costs further strengthen managerial incentives to ensure firm survival. Gilson (2008) documents that managers in firms that experience sharp declines in profitability are almost three times as likely to lose their jobs as other managers; resulting in substantial reductions in managerial wealth and limited future employment opportunities. Sundaram and Yermack (2007) moreover document that managers often hold a large fraction of their retirement funds in the firm, suggesting that post-employment concerns generate incentives to mitigate firm-specific risk. Because managers have difficulty diversifying their human and financial capital, they exhibit greater concerns over firm-specific risks than outside shareholders (Amihud and Lev, 1981). Consequently, this perspective indicates that executives approaching retirement should be more likely to engage in intense competitor tracking in an effort to mitigate firm-specific risk.

Concentrated owner welfare also bears a strong and direct link to firm performance and firm survival (Anderson and Reeb, 2004), which arguably depends on managers recognizing and responding to their corporate rivals (Porter, 1998). Unlike diversified shareholders, family owners hold a concentrated stake in a single firm that closely ties their well-being to firm survival and performance. Family owners maintain substantial economic incentives to ensure that managers balance family concerns of firm survival against profits apportioned to all shareholders. The strong historical and financial ties between families and their firms suggest that these owners have substantially greater interest in tracking corporate rivals relative to well-diversified shareholders. If so, we expect to observe a positive relation between family ownership and excess competitor tracking. This leads to our first hypothesis:

> **H1: Insider sensitivity to firm specific risk affects corporate emphasis on competitor tracking so that managerial age and family ownership exhibit a positive relation to excess competitor tracking.**

Corporate Creditors and Firm Risk

Creditor concerns over firm-specific risk may also induce managers to more thoroughly scan the competitive landscape. Fiss and Zajac (2004) observe that corporate creditors are traditionally more interested than outside shareholders in ensuring firms continue as ongoing and profitable entities so as to repay debt obligations. If firms fail to compete effectively, they lose market share and have difficulty creating the cash-flow needed to pay expenses, including debt obligations. Failure to meet debt obligations adversely impacts creditor value thereby incentivizing debtholders to impel the firm to take actions that assure repayment of debt.

Current and future rivals present competitive threats that affect firm default risk. In particular, because debtholders do not fully share in the firm's upside potential but do hold excess downside risk, they focus on activities that ensure payment of interest and principal. Lending agreements further bolster creditor abilities to protect their investment through managerial monitoring and control over investment decisions (Datta, Iskander-Datta, and Patel, 1999). The firm-specific risk reduction argument suggests that corporate creditors hold strong incentives to understand competitive threats so as to ensure firm survival. Consequently, this firm-specific risk perspective suggests a positive relation between firm leverage and competitor tracking. This leads to our second hypothesis:

> **H2: Creditor sensitivity to firm specific default risk affects corporate emphasis on competitor tracking so that firm leverage exhibits a positive relation to excess competitor tracking.**

The Costs of Competitor Tracking

The potential costs to outside shareholders of excess competitor tracking stems from both direct and indirect costs. The direct costs of competitor tracking include staffing, computer systems, and specialty software. Indirect costs include managerial effort and energy devoted to competitor

analysis that could alternatively be spent evaluating current or future projects. Aguilar (1967) observes, for instance, that identifying and assessing competitors' strategies can be a particularly difficult and time consuming managerial task. Furthermore, managers gaining knowledge of rival projects may be unwilling to undertake profitable investments because of fears of being "scooped" or beaten to market. Consequently, stakeholders concerned with firm survival may place greater emphasis on competitor tracking relative to diversified shareholders who can simply purchase stock in the competitors (or the overall market). Differing attitudes and exposure to firm-specific risk suggests that investments in rival tracking provide private benefits to corporate insiders and creditors at the expense of outside shareholders. Outside shareholders potentially view a greater emphasis on competitor tracking activities as providing limited value, or even detracting from value, because they hold little firm-specific risk within their portfolios. If so, we expect to observe a negative relation between excess competitor tracking and shareholder value. This leads our third hypothesis:

H3: Shareholder value will be negatively associated with excess competitor tracking.

Research and Development and Competitor Tracking

Competitor tracking potentially increases firm profitability, to the benefit of shareholders, by reducing search and discovery phases of production. For example, monitoring rivals may facilitate diffusion of R&D knowledge from competitors, sparking additional innovations or the completion of complementary projects (Pisano, 1990; Bettis, 1981). Further, rival tracking could cut firm costs by reducing duplicate research paths or by allowing firms to follow complementary research paths, confident they will garner the benefits of differing paths (Bernstein and Nadiri, 1988). Sinha and Cusumano (1991) suggest sharing complimentary "know-how" leads firms to invest more in R&D thereby resulting in greater firm productivity and profitability. Overall, R&D

spillovers potentially increase total market output through cost-reductions or through increased customer demand (Henderson and Cockburn, 1996). If tracking improves firm's internal R&D efficacy and thus increases firm profitability, then we expect that outside shareholders will benefit more from competitor tracking in R&D intensive firms than in non-R&D intensive firms. This leads to our fourth hypothesis:

> **H4: Shareholder value will be positively associated with excess competitor tracking in R&D intensive firms.**

Total Industry Profitability and Competitor Tracking

Underlying the practice of competitor tracking rests the notion that this activity potentially improves firm performance by increasing firm market share as opposed to increasing the overall market size and/or total industry profitability. A question thus arises as to whether competitor tracking increases market size or industry profitability. One avenue through which competitor tracking potentially improves total industry profitability is through tacit collusion or price coordination amongst rivals (Haveman and Nonnemaker, 2000). Collusion is typically defined as a situation where firms coordinate their activities (with or without explicit communications) to fix prices and market shares to attain greater than normal profits (Stigler, 1964). Successful collusion requires communication on the initial agreement and continuing information flows about product mix, prices, and costs (Compte, 1998). Formal models of collusion often refer to this as the informational costs of collusion and suggest that rival monitoring allows firms to achieve greater cohesion (Athey and Bagwell, 2001). In this context, competitor tracking potentially acts as a communication device that; (i) facilitates creation of the agreement, (ii) provides dynamic interaction amongst rivals concerning costs and prices, and (iii) assists in rival monitoring to limit cheating and to maintain a stable agreement. Thus, firms potentially engage in competitor tracking to reduce information costs and to facilitate tacit collusion.

Firms in fragmented industries with relatively small market shares may have difficulty in engaging in collusive behavior because of barriers in reaching an initial consensus and the inability to prevent rival firms from circumventing the scheme (Tirole, 1988). However, firms in more concentrated industries that hold large fractions of the total market can more easily police and monitor collusive agreements than firms in fragmented industries with small market shares (Campbell et al. 2005; Bresser, 1988). Outside shareholders of large market-share firms thus potentially perceive competitor tracking as a value-adding activity because it assists in the initiation and subsequent monitoring of collusive behavior. Consequently, if competitor tracking facilitates collusion amongst firms, then we expect to observe a positive relation between outside shareholder value (for firms in concentrated industries) and competitor tracking. This leads to our final hypothesis:

H5: Shareholder value will be positively associated with excess competitor tracking in concentrated industries.

Methods

For our empirical analysis, we used the 2003 and 2004 publicly-traded Fortune 1000 firms. Banks and public utilities were excluded because government regulations potentially restrict competitive forces in these markets and industries, and because regulation potentially affects firm performance. We collected data on competitor tracking from each firm's 10K reports. Accounting scholars note that 10Ks are prepared under the direct supervision of the CEO and CFO, especially the non-GAAP portions, as they are required to sign the documents attesting to their veracity and hold substantial legal liability if these disclosures are inaccurate (Amir and Lev, 1996). Moreover, prior research (Lewellen et al. 1996) uses these competitor reports to examine managerial biases in competitor tracking, focusing on which firms managers choose to examine. In our analysis, we focus on the intensity or number of rivals monitored rather than the specific rivals monitored. Our

final sample consists of 592 non-utility/non-banking firms; providing 1,138 firm-year observations for years 2003 and 2004.

Regulations stipulated by the U.S. Securities and Exchange Commission (SEC) require managers to identify their most important competitors and to appraise performance relative to these competitors in their annual reports and proxy statements (Regulation S-K 229.101C and for similar guidelines in Europe see Official Journal C372, 09.12.1997). Examining these competitor analysis reports, we observe stark differences amongst firms in the attention and specificity devoted to their competitive narratives. The differences in these narratives indicate that some firms more intensely focus on specific competitors and their activities while other firms primarily note the risks inherent in working in a competitive environment. One straightforward explanation for these observed differences in competitor tracking is that these managerial statements bear little, or no, relation to internal efforts or resources devoted to assessing competitors' actions. Rather, reported competitor tracking may simply be a listing of firms in the same SIC code or represent a convenient sample of poorly performing firms to make their own performance look better (Lewellen et al. 1996). To formally assess whether our approach captures the intensity of the competitor tracking process in the firm, we investigate three sets of correlations between the number of reported competitors and other measures of the competitive landscape in order to gauge whether these managerial reports reflect internal activities in competitor tracking.

First, we use data from an independent information intermediary to examine whether firms simply list all (or most) potential competitors to mitigate legal action or lawsuits by disgruntled investors. If fear of legal reprisal drives competitor reports rather than managerial perceptions of competition, we expect to observe a high correlation between managerial competitor reports and those provided by popular information intermediaries. Using the number of competitors listed by Mergent (an information intermediary) and the number of competitors reported by managers, we

find a correlation of only 8.9%. Managerial concerns of legal action also suggest a high reciprocity between target firm competitor reports and those competitors reporting the target. We find a correlation of only 13.9% between the number of firms reported by the target and the number of competitors that report the target. We also observe a correlation of only 14.2% between the number of firms within the same 4-digit SIC code and the number of competitors listed by the firm. Hence these managerial competitor reports appear neither to be strictly driven by fears of legal action nor a simple listing of firms from the same industry.

In our second set of correlations, we assess whether firms' competitor reports bear a relation to firm investments in rival tracking. In particular, we examine whether our target-firm employees maintain membership in the *Society of Competitive Intelligence Professionals* (SCIP). The SCIP is a professional organization with a mission to advance the skilled use of competitive intelligence to enhance business decision-making and organizational performance. Presumably, firms placing more emphasis on competitor tracking and thus reporting more competitors will have more employees as members of the SCIP. In contrast, firms reporting relatively few competitors or placing little emphasis on competitor tracking will likely have limited membership in SCIP. We find a correlation of 21.1% between the number of competitors reported by the target firm and the number of target-firm employees who are members of SCIP. The analysis suggests that firms with more employees as members of SCIP list a greater number of competitors than firms with fewer employees as members in SCIP. Generally, the result provides evidence consistent with the notion that managerial competitor reports reflect firms' commitment to tracking the competitive environment.

Our final data assessment examines the correlation between competitor tracking and future firm merger and acquisition (M&A) activity. If managerial competitor reports capture meaningful information on the firm's propensity to profile rivals, we then expect to observe a positive relation between the number of listed competitors and subsequent M&A activity. Alternatively, if these are

simply reports of convenience with little meaningful information, we expect little or no correlation between the number of reported competitors and M&A activity. Focusing on a five-year, forward-looking horizon, we find a 32.9% correlation between the number of competitors reported by the target firm and the number of mergers or acquisitions undertaken by the target firm. In sum, the results from our series of correlation tests provide fairly compelling evidence that managerial competitor reports bear a relation to firms' internal competitive tracking activities or investments. Still, similar to survey data, we cannot unambiguously rule-out the notion that managerial competitor statements could be unrelated to the firm's true recognition of rivals.

Dependent and Independent Variables

Managerial tracking of competitors represents our primary dependent variable. To ascertain the competitors for each firm in our sample, we culled the competition portion of the firms' 10K reports and recorded all firms that managers list as competitors (Lewellen et al. 1996). In total, for the years 2003 and 2004, our firms reported 8,140 competitors.

Our primary measure for firm recognition of rivals, *Excess Competitor Tracking*, focuses on the difference between the number of competitors reported by managers less an imputed measure of competitor tracking based on industry population, firm size, and industrial diversification. This measure is based on actual managerial reports of competition; industry and firm structure however, potentially affect the number of competitors that managers perceive and monitor. For instance, commodity-based industries typically have greater numbers of competing firms, indicating that these managers potentially report more rivals. Similarly, diversified firms can operate in many industries, again suggesting a greater number of competitors. To control for industry and firm structure, we use managerial reports of competition less an adjustment for the number of potential competitors, industrial diversification, and firm size. Specifically, the construction of the variable takes the form:

$$Excess\ competitor\ tracking = Reported\ Competitors - Expected\ Competitors \quad (1)$$

In the model, we measure expected competitors as the predicted value from the following regression equation.

$$Reported\ Competitors = a + \beta_1(Size) + \beta_2(Industrial\ Diversification) + \beta_3(\#\ Potential\ Competitors) + \varepsilon \quad (2)$$

Where:

Reported Competitors = the natural log of the number of competitors reported by the firm.
Size = natural log of the firm's total assets
Industrial Diversification = natural log of the number of different 4-digit SIC codes that the firm operates within.
 # Potential Competitors = natural log of the number of firms in each firm's 2-digit SIC code taken from *GlobalVantage Industry*.[1]

Our proxy of excess competitor tracking is the difference between natural logarithms with a mean value of zero, and minimum and maximum values of -1.35 and 1.75, respectively. Values greater than zero indicate that managers report more competitors than would be predicted based on firm size, industrial diversification, and the number of potential competitors. Conversely, values less than zero indicate that managers report fewer competitors than would be expected based on size, diversification and the number of potential competitors.

Our second proxy of competitor tracking uses the difference between the number of companies that the target firm lists as a competitor and the number of companies that list the target as a competitor. We label this measure as – *Adjusted Competitor Tracking* – that allows firms, themselves, to define the scope of the competitive environment. Specifically, *Adjusted Competitor Tracking* is the natural log of the Number of Competitors Listed by the Target Firm less the Number

[1] We use the number of firms in the same 2- digit level because it provides a broad measure of potential current and future competitors (similar results were obtained using 4- digit SIC codes). In further tests, we segregate our sample into the top and bottom quartiles of industry population to make sure we are not simply capturing differences in numbers of competitors. We find similar results in our tests for both high and low population industries. We also find similar results using Mergent data on the number of potential competitors.

of Competitors that List the Target Firm. Both the *excess competitor tracking* and *adjusted competitor tracking* measures are based on the notion that analyzing the number of competitors followed by a firm (with some scaling feature) provides a useful metric to gauge competitor tracking.

We focus on these simple proxies of competitor tracking, rather than a more subjective measure, for three reasons. First, our measures provide an objective and reliable proxy for competitor tracking that other researchers can easily replicate. It does not rely on a subjective classification of competitors by the researcher but rather allows firms/managers to identify the scope of their competitor tracking. Second, the literature on competitor tracking often focuses on whether firms under-identify their competitors, and our measure captures any managerial propensity to under report their competitors. Finally, our approach abstracts away from the identity of the competitors being reported and instead focuses on the intensity of competitor tracking.

We measure managerial risk preferences using CEO age. To measure managerial age, we use the natural log of CEO age obtained from S&P Execucomp and from corporate proxy statements. We measure Debtholder influence (leverage) as the ratio of long-term debt divided by total assets. Family ownership is measured with both a binary and a continuous variable (Anderson and Reeb, 2004). We use a dummy variable that equals one if the family's ownership stake exceeds 5% or more of the firm's outstanding shares and for robustness the fractional level of the family's ownership stake. Information on family ownership is manually collected from each firm's annual proxy statement. Our analyses point to similar inferences when comparing family firms as a single group or as separate shareholder groups (founders versus heirs).

We use two market-based measures of shareholder value, focusing on both long-term and short-term shareholder performance. The first, the market-to-book ratio, is constructed as the sum of the market value of common equity plus preferred stock plus the book value of long-term debt, all divided by total assets. Our second metric, economic value added (EVA), comes from Stern

Stewart Company and is measured as net operating profit less the book value of capital multiplied by the firm's cost of capital. EVA provides an annual measure of the firm's economic profits or return to shareholders.

Control Variables

We introduce several other control variables into our analysis to account for industry and firm characteristics. Firm age is measured as the natural log of the number of years since the firm's inception as noted by Hoover's.Com, Gale Business Resources, or individual firm's histories. Growth opportunities were measured as capital expenditures divided by net property, plant, and equipment. We measure firm accounting performance as return on assets from period *t-1*. In addition, because managerial listings of competitors may be driven by the quality of firm disclosure and not just represent internal variations in competitor tracking, we control for disclosure quality. We proxy for disclosure quality following Kim and Verrecchia (2001) who observe that both disclosed information and privately-held information affect security prices. To protect themselves against well-informed traders, uninformed traders will use changes in share price and share-trading volume to infer the existence of private information. Specifically, Kim and Verrecchia suggest that stock price sensitivity to trading volume can be used to gauge the quality of disclosure;[2] greater price sensitivity to trading volume is indicative of poor disclosure.

For our primary analysis, we use *excess competitor tracking* as our measure of firm/managerial recognition of corporate rivals. However, when we introduce the alternative measure of competitor

[2] We measure the sensitivity of stock price to trading volume as β_1 in:

$$Ln\left|\frac{P_t - P_{t-1}}{P_{t-1}}\right| = \beta_0 + \beta_1(V_t - V_{avg}) + \varepsilon_t$$

Where P_t is the closing price on day *t*, V_t is the daily trading volume in shares on day *t*, V_{avg} is the average volume in shares for the 6-month period. Intuitively, values of β_1 closer to zero indicate traders show less concern about private information while larger values indicate traders showing more concern with respect to private information trades.

tracking - *Adjusted Competitor Tracking* - we add several additional control variables, previously included in the calculation for excess competitor tracking. Barnett and McKendrick (2004) observe that firm size can influence rival potency. We control for firm size using the natural log of the book value of total assets. Because some firms work in multiple lines of business while other firms tend to remain focused on a single business, we use the natural log of the number of reported business segments that each firm operates within. Finally, some firms face more competitors, or faster moving competitors (Hambrick, Cho, and Chen, 1996), than others hence we control for the number of potential competitors using the natural log of the number of firms in each firm's 2-digit SIC code, taken from *GlobalVantage Industry*.

In our analysis focusing on the relation between competitor tracking and shareholder value, we include additional controls to account for industry performance. Specifically, to ensure that our results are not driven by highly competitive industries that earn low levels of profits, we include the industry median ROA as a control variable. We measure this as the median return on assets for all firms in the same 4-digit SIC code. In robustness analysis not reported, we also use the median ROA from all firms in the same 2-digit SIC code with similar results. We proxy for firm internationalization with the ratio of reported sales outside the U.S. divided by total sales. Cash flow volatility is the standard deviation of free cash flow over the past 12 quarters. Trade payables are measured as accounts payable scaled by total assets. Finally, we include dummy variables for each 4-digit SIC code in the analysis.[3]

Findings

Summary Statistics

[3] We used a pooled, ordinary-least squares regression to assess the factors that affect managerial tracking of competitors. In all of our regressions, we controlled for serial correlation and heteroskedasticity using the Huber-White-sandwich estimator with clustering on the firm identifier variable.

Table 1 presents three panels of descriptive information for our sample of firms. Panel A provides means, medians, standard deviations, and minimum and maximum values for the key variables in the analysis. Panel B shows a simple correlation matrix for the variables. Panel C displays different metrics for measuring competitor tracking. The total sample consists of 1,138 observations, comprised of 592 firms for the years 2003 and 2004. The firms in our sample are relatively large with average (median) total assets of $19.8 billion ($4.7 billion). We note that annual capital expenditures represent, on average, about 22% of net fixed assets. In terms of performance, the average firm in our sample has a return on assets (ROA_{t-1}) of 13.82% with a minimum and maximum value of -61.9% and 66.7%.

The correlation matrix in Panel B of Table 1 indicates that our measure of rival identification and monitoring – excess competitor tracking – exhibits a positive relation to CEO age and family ownership. However, we observe that excess competitor tracking bears a negative association with leverage. Finally, Panel C displays our two different metrics used to capture competitor tracking. The first row of panel C indicates that our target firms report, on average, 6.88 competitors with minimum and maximum values of 1.00 and 134 respectively. Firms appear to report substantially fewer competitors than the number of firms present in their 4-digit SIC code industrial sector (row 2). Specifically, we note that the average industry has about 60-firms with the typical target firm in our sample reporting only 6.88 competitors. Our two proxies of competitor tracking – excess competitor tracking and adjusted competitor tracking – exhibit relatively high Spearman correlation coefficients (0.808 and 0.750, respectively) with raw competitors reported by each firm.

Multivariate Results

Our first test examines whether managerial characteristics exhibit a relation to excess

competitor tracking. We estimate the following regression model:

$$\textit{Excess competitor tracking} = \beta_0 + \beta_1 (\textit{CEO Age}) + \beta_2 (\textit{Control Variables}) + \beta_3 (\textit{Year and Industry Variables}) + \varepsilon \quad (4)$$

Where;

Excess competitor tracking = the number of competitors identified by the firm/manager adjusted for the firm size, industrial diversification, and industry population.

CEO Age = the natural log of CEO age.

Control Variables = Return on $assets_{t-1}$ (performance), the natural log of the number of years in business (firm age), stock price sensitivity to trading volume (disclosure quality), and capital expenditures divided by property, plant and equipment (growth opportunities).

Year and Industry Variables = one for each year of our sample and one for each 4-digit SIC industry code.

We control for serial correlation and heteroskedasticity using the Huber White Sandwich Estimator (clustered on firm level identifier) for variance. Table 2 presents the analysis examining the relation between excess competitor tracking and managerial characteristics. The results in column 1 indicate that as CEO age increases, firms recognize more rivals, as suggested in hypothesis 1. Intuitively, a 10% increase in CEO age suggests that excess competitor tracking increases 2.91%.

Long-term Investors, Short-term Stakeholders and Competitor Tracking

We next turn to two other stakeholders that potentially affect rival tracking; family shareholders and debtholders. Using equation 4 we examine the impact of other stakeholder characteristics on excess competitor tracking. In column 2 of Table 2, we use a binary variable that equals 1.0 when family owners hold an equity stake of five percent or more. The results are consistent with hypothesis 1; family ownership is associated with excess competitor tracking. Specifically, the results in column 2 indicate that firms with family shareholders recognize about 14.8% more competitors than diffuse shareholder firms.[4]

The results presented in column 3 of Table 2 examine the impact of creditors on competitor tracking and provide evidence consistent with the risk reduction proposition. Economically, an

[4] Dividing family ownership into founder and heir firms gives similar inferences for both groups.

increase in leverage from 10% to 20% of assets indicates that excess competitor tracking increases by over four percent. The analysis implies that creditor influence results in managers closely scrutinizing the competitive landscape and reporting more corporate rivals as suggested in hypothesis 2. Column 4 (Table 2) presents a regression that includes all of our hypothesized variables that relate executive and other stakeholder attributes to rival tracking. The results indicate that the hypothesized attributes continue to bear the same signs and general levels of significance as observed in their individual analyses.

Alternative Tests on the Risk Hypothesis

In an alternative test to examine whether stakeholders' concerns over firm risk influence extensive competitor tracking, we focus on two sub-sets of our sample; low risk and high risk firms. If stakeholder risk-sensitivity explains our results, we expect to observe significant relations between our stakeholder variables and competitor tracking in high risk firms. In contrast, in low risk firms, the relation between the stakeholder variables and extensive competitor tracking should be weaker or insignificant. Table 2 (columns 5 and 6) presents the results of the analysis (based on total risk which is measured by the standard deviation of stock returns). Consistent with the intuition of the test, for firms in the bottom quartile of risk, we find that our stakeholder variables bear no significant relation to extensive competitor tracking (column 5). However, for firms falling in the top quartile of risk (column 6), we observe that CEO age, family ownership, and creditor influence exhibit significant relations to extensive competitor tracking as predicted by hypotheses 1 and 2.

The construction of our primary variable (excess competitor tracking) accounts for the number of potential competitors and our regressions further include several controls to account for other firm and industry characteristics. However, an alternative explanation for the observed results centers on the construction of our proxy for competitor tracking. To investigate whether our results

are driven by the variable construct, we developed an alternative metric – *Adjusted Competitor Tracking* – to capture competitor recognition. This simple alternative measure allows firms, themselves, to completely define the scope of the competitive environment. In column 7 of table 2, we use this alternative metric and repeat our analysis examining stakeholder influence on competitor recognition. The analysis indicates again, that managerial age, family ownership and corporate leverage are positively related to competitor tracking, providing further support for hypotheses 1 and 2.

A third concern with our analysis arises from our proxies for stakeholder attributes. In particular, because our risk hypotheses rests on the notion that stakeholders exhibit sensitivity to firm-specific risk, a question arises as to whether our proxies sufficiently capture the appropriate, underlying stakeholder characteristic. For instance, although managerial age potentially captures executives' sensitivity to firm-specific risk, our creditor and family firm proxies simply denote the presence of these stakeholders in the firm. Family sensitivity to firm-specific risk can arguably be more directly measured through their level of ownership rather with a binary variable. Families holding large equity stakes likely exhibit a greater sensitivity to firm-specific risk relative to families with smaller positions (Anderson and Reeb, 2003). Likewise, creditors bearing a greater probability of firm default (i.e., poor credit ratings) likely exhibit a greater sensitivity to firm-specific risk than creditors with more secure investments. We empirically test the relations between the level of family ownership, creditor default risk, and excess competitor tracking using equation 4. The level of family ownership exhibits a positive and significant relation to excess competitor tracking (coefficient estimate of 0.369 and a t-value of 2.72). As family-ownership levels increase, firms increasingly engage in greater tracking of their competitors; suggesting that family incentives to minimize firm-specific risk affect the level of competitor tracking. Similarly, we find that as creditors increasingly bear greater levels of default risk, firms tend to engage in greater competitor

tracking (coefficient estimate of 0.048 and t-value of 3.76). Creditor sensitivity to firm-specific risk appears to be a significant factor in understanding the emphasis that managers place on competitor tracking.

Competitor Tracking and Shareholder Value

To gain insights into outside shareholders' perspectives on rival recognition activities, we examine the relation between shareholder value and competitor tracking. Table 3 presents the results between excess competitor tracking and shareholder value. We use two measures of shareholder value, focusing on both short and long-term performance. In columns 1 - 3, we show the results with EVA as the dependent variable and columns 4 - 6 present the results with market-to-book ratio as the value measure. Our analysis suggests that excess competitor tracking exhibits a negative and significant relation to shareholder value as suggested in hypothesis 3. Specifically, the results from column 4 indicate that a one-standard deviation increase in excess competitor tracking (0.609) is associated with a 6.05% decrease in market-to-book ratio. We find similar results using EVA as our measure of shareholder value. When using an alternative construct for competitor tracking (columns 3 and 6), we again note that outside shareholders appear to perceive competitor tracking as destroying shareholder value. The coefficient estimates on Adjusted Competitor Tracking are negative and significant when using either EVA or market-to-book ratio as the dependent variable. Overall, our results indicate that outside shareholders, on average, do not perceive greater levels of competitor tracking as a value-adding activity for the firm.

Robustness Testing of Competitor Tracking and Shareholder Value

We find support for the notion that corporate insiders and concentrated stakeholders engage in rival tracking to reduce idiosyncratic risk, thereby imposing costs on outside shareholders.

Competitor tracking however, could instead be a function of poor firm performance. As firm performance deteriorates, managers may respond by focusing more intently on their competitors; suggesting a potential endogeneity concern. To provide insights into the endogeneity issue, we use an instrumental-variable two-stage least squares (IV-2SLS) framework to estimate the relation between the level of competitor tracking and firm performance. In the first-stage regression, we develop an instrument for excess competitor tracking based on the depth of the managerial labor market. The intuition behind the instrument focuses on the notion that managers' incentives to profile competitors depends on the difficulty (or ease) of finding new employment. Managers with greater access to the professional labor market arguably have weaker incentives to focus on corporate competitors while managers with few external opportunities possess strong incentives to understand competitive threats.

We proxy for the depth of the managerial labor market by examining the availability of managerial-level jobs in the locality of the firm's headquarter. In particular, we use the ratio of professionals plus managers to total population of the Metropolitan Statistical Area (MSA) of the firm's headquarters (available from the U.S. Census Bureau). The first-stage of the IV-2SLS specification takes the form of;

$$\textit{Excess competitor tracking} = f\ (\textit{Managerial Labor Market and Control Variables}) \qquad (5)$$

The predicted value of excess competitor tracking from this model then becomes our independent variable for competitor recognition in the second stage regression.

$$\textit{Shareholder Value (EVA and Market-to-book ratio)} = f\ (\textit{Predicted Value of Excess competitor tracking and Control Variables}) \qquad (6)$$

We conducted two tests of the IV-2SLS specification. The first examines whether OLS and IV-2SLS provide similar estimates. A rejection of the null hypothesis indicates an endogenous regressor (competitor tracking) and thus the use of instrumental variable techniques. Using the Wu-Hausman test statistic (F-value=17.08, p=0.001), we reject the null hypothesis and conclude

competitor tracking is endogenous and thus proceed with 2SLS. The second, a partial F-test, examines the power of the instrument to predict excess competitor tracking. The test examines whether the ratio of professionals and managers to total population for the firm's MSA is equal to zero in predicting excess competitor tracking. The partial F-statistic (F=13.86, p=0.001) indicates rejection of the null and we thus conclude our instrument exhibits sufficient explanatory power in explaining competitor tracking.

Table 4, columns 1 and 2, show the first- and second- stage regressions from the model. We again observe a significant and negative coefficient estimate on predicted competitor tracking, which is consistent with the idiosyncratic risk argument (we also repeated the analysis with EVA with similar results). Overall, our robustness tests provide evidence additional support for hypothesis 3.

Specific Situations and Competitor Tracking

Our analyses indicate that corporate insiders and creditors appear to place great emphasis on competitor tracking but outside, diversified shareholders, on average, penalize firms that engage in this activity. To gain further insights into this apparent conflict arising amongst stakeholder groups, we examine two situations where shareholders are perhaps more likely to benefit from competitor tracking; (i) R&D intensive firms or industries and (ii) firms or industries benefiting from collusive behavior.

Table 5, columns 1 and 2, shows the empirical analysis examining the R&D proposition. For this test, we segregate our sample into R&D intensive firms and R&D non-intensive firms. The distinction between R&D intensive and non-intensive is based on a simple split between those firms reporting research and development expenditures and those reporting a zero-value for this expenditure. Our results indicate that competitor tracking exhibits a negative relation to shareholder value in R&D intensive firms and an insignificant relation to shareholder value in non-intensive

R&D firms. The analysis provides no support for hypothesis 4 and the notion that competitor tracking creates synergistic knowledge diffusion for R&D intensive firms that benefits diversified shareholders. Rather, these results appear to be consistent with the risk-reduction argument that suggests firms seek to mitigate default risk associated with R&D spending at the expense of outside shareholders.

Columns 3 and 4 of Table 5 show the empirical results investigating the collusion proposition. We measure industry concentration using a Herfindahl Index based on sales of firms in the same 2-digit SIC code. Column 3 shows the results for firms operating in more competitive industries (bottom quartile of Herfindahl Index) and column 4 presents the results for firms working in more concentrated industries (top quartile of Herfindahl Index). The results of the analysis support the notion (hypothesis 5) that competitor tracking facilitates collusive behavior amongst firms, thereby benefiting outside shareholders. In particular, we observe a positive relation between shareholder value and competitor tracking for firms in concentrated industries. For firms in less concentrated or fragmented industries, outside shareholders still appear to view competitor tracking as a non-value adding activity (negative relation).

Conclusions

A large practitioner and academic literature suggests that competitor tracking represents a fundamental and necessary task for firms to retain their competitive advantage and to sustain future performance (Porter, 1998; Zajac and Bazerman, 1991). Interestingly, a substantial variation exists in both the depth and degree of reported competitor tracking amongst firms, even within the same 4-digit SIC code. Our arguments on the cross-sectional differences in competitor tracking focus on whether differing attitudes towards risk amongst stakeholders affects competitor tracking. More specifically, this risk argument suggests that managers, family owners and creditors pursue

competitor tracking to reduce firm-specific risk, thereby enhancing firm survival at the expense of well-diversified shareholders.

We interpret the evidence to indicate that stakeholder interests affect the tracking of corporate rivals. Specifically, the results suggest that managers with greater levels of human capital tied-up in the firm identify more competitors than managers with less firm-specific capital. Family shareholders and corporate creditors also appear to compel managers to engage in excess rival tracking. Our analysis on the relation between excess competitor identification and shareholder value indicates that outside shareholders negatively value such activities. Even after incorporating numerous industry-level controls and controlling for disclosure quality, we find a negative relation between excess competitor tracking and Tobin's Q (and EVA). In particular, the results indicate that a one-standard deviation increase in excess competitor tracking is associated with a 6% decrease in Tobin's Q. We also found that competitor tracking had a negative impact on shareholder wealth among R&D intensive firms.

Thus, our investigation makes an important contribution to the competitor tracking literature, suggesting that the firm's various stakeholders value competitor tracking depending on their exposure to firm-specific risk. Those with the most exposure to firm-specific risk appear to place great emphasize on competitor tracking while those with little or no exposure, perceive such expenses as value destroying. Our results offer two implications depending on whether these are viewed from an industrial economic perspective or an agency perspective. From an agency outlook, the results suggest that insiders make expenditures on excess competitor tracking at the cost of outside diversified shareholder. Outside shareholders thus should take actions to curtail these expenditures to prevent insiders from obtaining private benefits of control. Yet, from an industrial organization perspective, the results indicate that excess competitor tracking enhances firm survival and provides benefits to most firm stakeholders.

We further contribute to the literature on collusive and cooperative pricing amongst firms (Clemons et al. 2002; Campbell et al. 2005). In concentrated industries, competitor tracking exhibits a positive relation to shareholder value. This result provides evidence consistent with the notion that tracking facilitates collusion amongst firms and improves performance, thereby benefiting diversified shareholders as well as other firm stakeholders (with the exception of customers). This implies that all firm stakeholders, with the possible exception of customers, may place great value on excess competitor tracking in situations where industry profitability and or market size can be increased through this activity.

Overall, our study tends to suggest that well-diversified shareholders perceive excess competitor tracking as destroying firm value. Yet, managers, creditors and family owners tend to place great emphasis on understanding and assessing corporate rivals. Our analysis indicates that this paradox occurs because the firm's various stakeholders value competitor tracking as a function of their exposure to firm-specific risk. Stakeholders with substantial exposure to firm-specific risk stress competitor identification while those with little or no exposure perceive such activities as destroying firm value. While conventional wisdom and the business literature unambiguously advocate that managers invest in competitor tracking, our analysis indicates that outside shareholders do not view competitor tracking as a value adding activity in many situation but that this activity may benefit other stakeholders by reducing firm default risk.

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Appendix A
Illustrative Example of Competitor Tracking on Diversified Shareholder

Consider an industry with just 2 firms (firms A and B.) Each firm has a 50% market share, $100 in gross profits, and $50 in interest payments to their respective local banks. In addition, each firm is one half owned by corporate insiders and the other half by an outside shareholder who owns the equity in both firms A and B. In this simple framework, we then explore the potential impact of Firm A developing some attribute that allows Firm A to take market share from Firm B.

For convenience, we assume this new attribute of A would allow them to garner 70% of the market share, providing $140 of the industry's gross profit. The table below shows the impact on firm profits, corporate insiders (family and managers), outside shareholders, and corporate creditors from Firm A introducing their new product attribute. Firm B is now just able to make their debt payments; increasing the probability of firm default. Consequently, the creditors in the Firm B would prefer investment into competitor tracking to minimize the probability of default. Similarly, corporate insiders in Firm B also prefer to engage in competitor tracking to mitigate or reverse these industry changes. However, the outside shareholder that holds equity positions in Firms A and B receives the same payoff in the original industry configuration and the new industry configuration. The outside shareholder thus receives no benefit from competitor tracking and thus would prefer that Firm B not engage in this activity. Morever, if Firm B engages in competitor tracking, this would require an investment outlay and thus detract from the outsider shareholder's profits.

Stakeholder	**Initial Industry Configuration**	**New Industry Configuration after Firm A Garners new Market Share**
Firm A		
Gross Profits	$100	$140
How Divided Among Stakeholders		
Payments to Creditors	$50	$50
Corporate Insiders	$25	$45
Diversified Outside Shareholder	$25	$45
Firm B		
Gross Profits	$100	$60
How Divided Among Stakeholders		
Payments to Creditors	$50	$50
Corporate Insiders	$25	$5
Diversified Outside Shareholder	$25	$5
TOTAL Profits to Diversified Outside Shareholder	**$50**	**$50**

Note: Competitor tracking may be even more important to managers than this example illustrates because they also face potential pay cuts or job loss.

Table 1
Descriptive Data

Panel A: Summary Statistics for the Full Sample

Variable	*Mean*	*Median*	*Std. Dev.*	*Minimum*	*Maximum*
Raw Competitors Listed	6.881	3.00	8.75	1.00	134.00
Extensive competitor tracking	0.002	-0.189	0.644	-1.351	1.753
CEO Age	55.54	55.00	7.32	36.00	91.00
Ln (CEO Age)	4.01	4.01	0.132	3.58	4.51
Debt Ratio (%)	19.79	17.65	17.18	0.00	68.82
Cash-Flow Volatility (risk)	0.072	0.037	0.093	.003	0.541
Total Assets ($,000,000)	19,832	4,720	67,560	329	798,660
Ln (Total Assets)	8.63	8.46	1.39	5.80	13.59
(Return on Assets) $_{t-1}$	13.82	13.58	9.86	-61.87	66.68
Foreign Sales (%)	23.67	16.60	24.92	0.00	97.14
Capital Exp./PPE Net (%)	21.99	18.17	15.03	1.86	95.25
Business Segments	3.04	3.00	1.91	1.00	9.00
Market-to-book ratio	1.681	1.209	1.519	0.278	8.00
EVA/Assets	0.002	0.009	0.085	-0.402	0.365

Panel B: Correlation Data

	Extensive Comp Tracking	Ln (CEO Age)	Family Own.	LT Debt / Assets	Market-to-book ratio
Extensive Comp Prof	1.000				
Ln (CEO Age)	0.027	1.000			
Family Ownership	0.003	-0.013	1.000		
LT Debt / Assets	-0.009	0.055	0.039	1.000	
Market-to-book ratio	-0.049	-0.073	0.023	-0.268	1.000
EVA/Assets	-0.145	0.002	0.048	-0.184	0.032

Panel C: Competitor Measures

	Mean	Median	Std. Dev.	Minimum	Maximum
Raw Competitors	6.880	3.000	8.750	1.000	134.000
SIC Competitors (4-digit)	59.897	24.000	82.332	1.000	343.000
Extensive Comp. Tracking	0.002	-0.189	0.644	-1.351	1.753
Adjusted Competitors	1.428	1.386	0.837	0.000	4.820

Table 2
Excess competitor tracking and Firm Characteristics

	Excess competitor tracking						*Adjusted Competitor Tracking*
Model	1	2	3	4	5	6	7
	CEO Incentive	Family Incentive	Creditor Incentive	Joint	Low Risk	High Risk	Alternative Measure
Intercept	-1.555***	-0.456***	-0.463***	-1.781***	-0.698	-2.157	0.033
	(2.62)	(2.34)	(2.40)	(2.84)	(0.61)	(1.80)	(0.02)
Ln (CEO Age)	0.297**	-	-	0.296**	0.177	0.676***	0.517***
	(2.12)			(2.02)	(0.66)	(2.42)	(2.84)
FamilyFirm	-	0.105***	-	0.135***	-0.101	0.244***	0.087***
		(2.44)		(2.93)	(1.14)	(2.75)	(2.52)
Debt Ratio	-	-	0.498***	0.692***	-0.254	0.506***	0.866***
			(3.05)	(3.69)	(1.01)	(2.12)	(4.21)
$(ROA)_{t-1}$	-0.457*	-0.491**	-0.271	-0.207	-0.370	-0.965**	-0.254
	(1.86)	(2.04)	(1.11)	(0.69)	(1.01)	(2.26)	(0.76)
Ln (Firm Age)	0.005	0.013	0.010	-0.021	-0.052	0.035	-0.050
	(0.20)	(0.49)	(0.39)	(0.76)	(1.09)	(0.61)	(1.42)
Disclosure Quality	4.621**	5.466*	3.643	8.857***	2.183	-8.489	4.484
	(1.66)	(1.91)	(1.31)	(2.74)	(0.48)	(0.83)	(0.93)
Capex/P,P&E	0.573***	0.533***	0.609***	0.403*	1.450***	0.091	0.362
	(3.28)	(3.04)	(3.50)	(1.94)	(2.90)	(0.36)	(1.64)
Ln (Total Assets)	-	-	-	-	-	-	-0.122***
							(4.60)
Ln (Business Seg.)	-	-	-	-	-	-	0.203***
							(3.07)
Ln (Indust. Pop.)	-	-	-	-	-	-	-0.039
							(0.11)
Dummies for 4-digit SIC and Yr.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2 (%)	0.339	0.344	0.347	0.374	0.251	0.141	0.443
Observations	1,138	1,138	1,138	1,005	287	286	1,005

T-values are in parentheses and corrected for serial correlation and heteroskedasticity. ***, **, * - indicates significance at the 1%, 5%, or 10% level or better.

Table 3
Excess competitor tracking and Shareholder Value

	Dep. Variable = EVA/Total Assets			*Dep. Variable =Market-to-book ratio*		
Model	*1*	*2*	*3*	*4*	*5*	*6*
Intercept	0.004	-0.028	-0.012	1.752*	-0.083	2.068*
	(0.28)	(0.61)	(0.45)	(1.65)	(0.60)	(1.94)
Excess competitor tracking	-0.005**	-0.005**	-	-0.115**	-0.116**	-
	(2.05)	(2.31)		(2.03)	(2.17)	
Adjusted Competitor Tracking	-	-	-0.006**	-	-	-0.134***
			(2.12)			(2.95)
Ln (CEO Age)	-	-0.002	-	-	0.078	-
		(0.17)			(0.35)	
Family Firm	-	0.006**	-	-	0.158**	-
		(1.96)			(2.24)	
Debt Ratio	-	-0.022**	-	-	-2.428***	-
		(2.13)			(9.57)	
Ln (total assets)	-0.002	0.002	0.001	-0.212***	-0.127***	-0.223***
	(1.27)	(1.58)	(0.10)	(6.58)	(3.92)	(6.89)
Cash Flow Volatility	-0.057***	-0.064***	-0.080***	0.004	0.723**	0.033
	(3.96)	(4.15)	(3.94)	(0.01)	(2.05)	(0.09)
Industry Median ROA	-0.047***	-0.043***	-0.038	2.055	2.982	2.046
	(3.64)	(3.25)	(1.20)	(0.66)	(1.02)	(0.66)
$(ROA)_{t-1}$	0.405***	0.436***	0.489***	3.731***	5.629***	3.717***
	(24.71)	(22.03)	(22.36)	(9.54)	(13.49)	(9.53)
Ln (Firm Age)	0.001	0.001	0.001	-0.054	-0.058	-0.052
	(0.51)	(0.23)	(0.40)	(1.21)	(1.35)	(1.17)
Disclosure Quality	-0.415*	-0.696***	-0.572*	14.901***	20.193***	14.277***
	(1.76)	(2.67)	(1.66)	(2.59)	(3.37)	(2.49)
Capex/P,P&E	0.015***	0.035***	0.016**	0.382***	0.904***	0.390***
	(2.57)	(2.96)	(2.00)	(2.84)	(3.35)	(2.90)
Foreign Sales	-0.032***	-0.027***	-0.041***	-0.668***	-0.383**	-0.675***
	(4.97)	(3.98)	(3.71)	(3.76)	(2.19)	(3.81)
Trade Payables	0.059***	0.062***	0.062***	-0.567	-0.773	-0.561
	(4.12)	(4.34)	(2.71)	(1.44)	(1.21)	(1.43)
4-digit SIC and time Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2 (%)	0.584	0.597	0.601	0.547	0.653	0.550
Observations	1,138	1,005	1,138	1,138	1,005	1,138

T-values are in parentheses and corrected for serial correlation and heteroskedasticity. ***, **, * - indicates significance at the 1%, 5%, or 10% level or better.

Table 4
Endogeneity Between Firm Value and Excess competitor tracking

	1	2
	1st Stage Regression	*2nd Stage Regression*
Dependent Variable	*Excess competitor tracking*	*Market-to-book ratio*
Intercept	-0.510	0.197
	(0.42)	(0.15)
Predicted Excess competitor tracking	-	-1.991***
		(2.90)
Ln (total assets)	-0.015	-0.242***
	(0.81)	(4.93)
Cash Flow Volatility	0.559***	0.838
	(2.72)	(1.39)
Industry Median ROA	0.213	2.555
	(0.12)	(0.55)
$(ROA)_{t-1}$	-0.310	3.078***
	(1.36)	(4.90)
Ln (Firm Age)	0.012	-0.033
	(0.46)	(0.50)
Disclosure Quality	5.329	24.299***
	(1.59)	(2.64)
Capex/P,P&E	0.060	0.482***
	(0.77)	(2.37)
Foreign Sales	-0.107	-0.921***
	(1.03)	(3.30)
Trade Payables	-0.100	-0.805
	(0.44)	(1.36)
Executive Labor Market	-0.015***	-
	(3.72)	
4-digit SIC and time Dummies	Yes	Yes
Adjusted R^2 (%)	0.348	-
Observations	1,138	1,138
Partial F-test (F-value)	13.86***	-
Wu-Hausman F-test (F-value)	-	17.08***

T-values are in parentheses and corrected for serial correlation and heteroskedasticity. ***, **, * - indicates significance at the 1%, 5%, or 10% level or better.

Table 5
Value Impacts of Competitor Tracking in Specific Situations

	Dependent Variable = Market-To- Book Ratio			
	Non-Intensive R&D Firms	*Intensive R&D Firms*	*Competitive Industries*	*Concentrated Industries*
Model	1	2	3	4
Intercept	1.417*	1.602	2.866	1.595
	(1.69)	(0.60)	(1.29)	(1.57)
Excess competitor tracking	0.055	-0.197**	-0.282**	0.165**
	(0.92)	(2.13)	(2.29)	(2.15)
Ln (total assets)	-0.157***	-0.166***	-0.332***	-0.207***
	(4.94)	(2.98)	(4.12)	(3.68)
Cash Flow Volatility	-0.605	-0.345	-0.712	-0.820
	(1.64)	(0.61)	(1.18)	(1.43)
Industry Median ROA	1.760	-0.473	-0.916	3.640
	(0.79)	(0.05)	(0.12)	(1.35)
$(ROA)_{t-1}$	5.590***	3.306***	2.147*	6.206***
	(12.42)	(5.04)	(1.79)	(5.82)
Ln (Firm Age)	-0.008	0.009	0.028	-0.033
	(0.20)	(0.12)	(0.39)	(0.52)
Disclosure Quality	-3.349	31.286***	34.460***	-4.467
	(0.72)	(2.57)	(2.56)	(0.73)
Capex/P,P&E	0.032	2.405***	2.903***	0.046
	(0.36)	(5.34)	(3.49)	(0.83)
Foreign Sales	0.208	-1.290***	-0.899***	-0.079
	(1.01)	(4.68)	(2.79)	(0.25)
Trade Payables	0.211	-3.391***	-5.100***	-0.488*
	(0.74)	(2.83)	(3.04)	(1.89)
Year and 2 (4)-digit SIC dum.	Yes	Yes	Yes	Yes
Adjusted R^2 (%)	0.652	0.461	0.405	0.665
Observations	604	534	273	289

T-values are in parentheses and corrected for serial correlation and heteroskedasticity. ***, **, * - indicates significance at the 1%, 5%, or 10% level or better.