To Know or Not to Know:
Stock Market Implications of Firms with Superior Knowledge Management

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ABSTRACT: In recent years firms have dramatically increased their expenditures on “knowledge management” (KM), where KM can be defined as the processes managers use to create new knowledge and leverage existing knowledge. Economic theory argues that knowledge is an important driver of firm value and case study evidence suggests that firms with superior KM practices outperform their peers. We are unaware, however, of any systematic evidence that KM benefits shareholders. We fill this void by examining the stock market reaction to companies receiving the “Most Admired Knowledge Enterprise” (MAKE) award, which recognizes companies that excel at KM. We find that MAKE winners experience abnormal stock returns of 1.25% during the five days surrounding the award announcements, and that the magnitude of the abnormal returns is correlated with MAKE winners’ future operating performance. We also find that MAKE winners report superior accounting performance relative to their peers subsequent to the receipt of the award, and that analysts make significant upward revisions to MAKE winners’ earnings forecasts during the month following the award. Taken together, our findings are consistent with superior KM practices creating shareholder wealth by improving future operating performance. These findings are consistent with economic theory that argues knowledge is a fundamental driver of firm value, and with KM literature in a variety of business disciplines that alleges superior KM practices provide firms with a competitive advantage.

Keywords: knowledge management; asset pricing; valuation; information; performance.

Data Availability: Data are available from public sources indicated in the text.

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"The economic problem of society is thus not merely a problem of how to allocate given
resources…it is a problem of the utilization of knowledge not given to anyone in its
totality."

- F. A. Hayek
“The Use of Knowledge in Society”

I. INTRODUCTION

Economists have long recognized that knowledge plays a central role in creating firm
value (e.g., Schumpeter, 1934; Hayek, 1945; Machlup, 1962). Recently, rapid advances in
information technology have increased firms’ ability to manage knowledge. At the same time,
growth in intellectual capital and global competition have increased the benefits of “knowledge
management” (KM). In response, expenditures on KM have grown dramatically, increasing from
$400 million in 1994 to $34 billion in 2007, and are expected to exceed $150 billion in 2012
(O’Leary, 1998; GIA, 2008). In addition, a large body of case study evidence suggests that
management’s increased investments in KM can improve financial performance (e.g., Barclay
and Murray, 1997). There is little systematic evidence, however, that superior KM enhances
shareholder value. The purpose of this study, therefore, is to test whether KM increases
shareholder value by examining the stock market reaction and future performance of companies
receiving the “Most Admired Knowledge Enterprise” (MAKE) award.

MAKE awards are granted annually by an international organization of knowledge
management professionals to acknowledge companies that excel in using KM to create
organizational wealth (Asian Productivity Organization, 2007). While there is no single accepted
definition for KM, a typical definition is “the processes through which organizations generate value from their intellectual and knowledge-based assets” (Levinson, 2006). “Knowledge-based assets” in this context refer to knowledge within the firm about factors that create firm value (Boisot, 1999). In essence, KM addresses the comment by Hewlett Packard’s Chairman that “I wish we knew what we know at HP” (O’Dell and Grayson, 1998). The notion underlying this quote is that companies contain vast reservoirs of valuable knowledge, and tapping into this knowledge can create substantial wealth. The objective of KM is to capture, leverage, and reuse this knowledge, as well as create new knowledge. To achieve this, KM activities commonly include sharing best practices, identifying internal experts, and facilitating the exchange of information among employees (Barclay and Murray, 1997; O’Leary, 2007).

Economists have recognized the importance of knowledge as early as Schumpeter (1934), which argues that knowledge creation, along with its application, is the cornerstone of economic growth. The economics literature on knowledge has grown enormously since Schumpeter (1934) and now influences numerous economic sub-disciplines. At the firm level, Hayek (1945) provides prescient insights into KM by observing that a major barrier in creating firm value is harnessing the knowledge that resides “within the heads” of employees, many of whom are widely dispersed. An analogy that captures Hayek’s observation is that firms consist of islands of knowledge, and KM systems attempt to bridge these islands (e.g., Melster and Davenport, 2005). Another important influence from economics on the KM literature is Machlup (1962), which empirically documents the shift in the US economy from industrial-based to knowledge-based. An important observation in Machlup (1962) is that while success in an industrial-based economy depends primarily on industrial inputs such as natural resources and labor, success in a knowledge-based economy depends primarily on investments in knowledge assets, such as expertise and intellectual property.
More recently, a large body of literature outside of economics, spanning many business disciplines, investigates the recent trend in managers adopting KM systems. Much of this research consists of case studies documenting how companies implement KM systems and the benefits these systems produce (e.g., O’Leary, 2008). These case studies present examples of successfully implemented KM systems across a wide variety of industries and in virtually all functional areas (e.g., sales, production, logistics, marketing, operations, human resources, and financial). A striking feature of this literature is the number of anecdotal cases suggesting that KM generates significant cost effective improvements in operating performance (e.g., Nonaka, 1991).

Two KM case studies are summarized in Appendix B. The first discusses Siemens Corporation’s response to a dramatic increase in global competition and poor financial health in the late 1990’s. Among other things, Siemens developed “knowledge communities” that allow globally dispersed business units to share best practices within the organization for solving customer problems. In particular, this system reuses customer solutions across different developing economies, and as these economies develop, it leverages solutions from more developed economies. Siemens management claims this KM system increased 2001 sales by $122 million at a cost of under $8 million. The second case study in Appendix B discusses British Petroleum’s (BP) response to a loss of knowledge from significant downsizing and decentralization, which resulted in a drastic reduction in employees and increased geographic dispersion. Among other things, BP created a search engine with a “who is who” feature called

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2 There are also a large number of articles in the popular press that provide management self-reports of large net benefits from instituting KM systems. According to a PwC survey of public company CEOs, ninety-seven percent believe that knowledge management is an “absolutely critical factor” for firm success (PwC, 1999).

3 The “loss of knowledge” due to factors such as downsizing and the recent trend in early retirement is an impetus for KM systems that locate, document, and retain extant knowledge within the firm (Alavi and Leidner, 2001). A survey by KPMG reports that loss of staff impaired customer relations in 43% of the firms surveyed and 13% reported a loss of income as a result of losing a single employee (KPMG, 1998).
“Connect,” that allows employees to easily access others with the knowledge needed for a given task. According to BP, this KM system increased net income by $260 million in a single year (Stewart, 1999).

Whereas economic theory argues that knowledge is an important driver of value creation, and a large body of case-study evidence from a broad variety of business disciplines suggests that KM initiatives provide firms with a competitive advantage, we are unaware of research that tests whether superior KM is associated with increased shareholder value. Thus, the purpose of this paper is to test whether superior KM practices increase shareholder value, where superior KM practices are evidenced by receipt of a MAKE award. MAKE awards are issued by Teleos, an independent research firm, in conjunction with the KNOW Network, a global organization of KM professionals (Asian Productivity Organization, 2007). MAKE winners are selected by panels of KM experts typically ranging in size from 750 to 3,000 members. The panelists select winners using the Delphi research methodology, a process developed by Rand Corporation to improve decision-making by expert groups (Dalkey, 1969)\(^4\). The panelists include KM experts from public and private organizations, as well as executives from global corporations (including Chief Knowledge Officers, Chief Information Officers, and Chief Learning Officers). The panel’s objective is to identify firms that excel at transforming enterprise knowledge into superior products and services that increase shareholder wealth, or in the case of non-public and not-for-profit organizations, increase societal capital. MAKE winners include public, non-public, and not-for-profit organizations. Because each MAKE award panelist possesses his or her individual information and expert opinions about potential MAKE winners, the consensus

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\(^4\) Evidence suggests that the Delphi process results in group decisions that are superior to the decisions of the individual members (Dalkey, 1969).
decision is expected to provide new information to the market about the winners’ abilities to effectively manage knowledge.⁵

Our first test examines the abnormal stock returns of the MAKE winners during the five-day window surrounding the award announcement. Because superior KM practices are expected to result in superior operating performance, and because winning a MAKE is expected to provide new information to the stock market about firms’ KM abilities, we expect a positive stock market reaction to the announcement. Our sample consists of all publicly traded MAKE winners from 2001 through 2008 with available data, comprising 247 MAKE awards issued to 46 distinct firms. Our event study test finds a significantly positive mean abnormal return of 1.25% during the five days surrounding the MAKE award announcement, consistent with the MAKE awards providing new information to the market about firms’ superior KM abilities, and with the market expecting superior KM practices to result in superior operating performance.

Our second test analyzes whether the magnitude of the abnormal returns found in our first test is associated with superior future operating performance. If the stock market reaction during the announcement window reflects market expectations that superior KM practices result in higher future operating performance, we expect a positive association between the MAKE announcement abnormal returns and future performance. We test this prediction by regressing three future performance measures on the abnormal stock returns around the announcement date. The three performance measures are return-on-assets (ROA), return-on-equity (ROE), and cash flows from operations over total assets (CFO), and are measured over the four quarters following the MAKE award announcement quarter. After controlling for market expectations of future

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⁵ Examples of public companies winning a MAKE award include Toyota, Microsoft, Apple, Nokia, Caterpillar, General Electric, and 3M. Examples of non-public and not-for-profits winning a MAKE award include KPMG, NASA, the BBC, the US Navy, Wikipedia, the Hong Kong Police Department, and the Korean Water Resources Agency.
performance, we find a significantly positive association between both of our accounting-based performance measures, ROA and ROE, and the five-day abnormal stock returns. This is consistent with the abnormal returns around the announcement dates being a rational response to information about superior future operating performance by the MAKE winners.

Our third test examines our prediction that MAKE winners outperform their peers. This analysis compares our three performance measures (ROA, ROE, and CFO) during the four quarters following the receipt of the MAKE award with two matched portfolios of peer firms. One peer firm portfolio is matched on industry and the other is matched on both industry and percentile of total assets. We find that the MAKE winners outperform both matched peer portfolios for each performance measure. This finding corroborates our stock market analysis and is consistent with superior KM resulting in superior future operating performance.

Our fourth test analyzes whether equity analysts revise their annual earnings forecasts upward for MAKE winners. Because we expect the MAKE award to provide new information to the market about the winners’ future performance, we expect equity analysts to revise their beliefs about the MAKE winners’ future performance. We find that during the month following the MAKE award announcement month, the number and proportion of analysts that revise their forecasts upward are significantly higher than the number and proportion of analysts that revise their forecasts downward. We also find that the net forecast revisions for the MAKE winners are significantly higher than for their peers. These findings lend support to the evidence that the MAKE awards convey new information to the market about the MAKE winners’ superior KM abilities, which in turn results in higher future performance.

Our fifth test investigates abnormal stock returns over a 12-month period following the announcement of the MAKE awards. It is only relatively recently that companies have begun to make large investments in KM, and the MAKE awards are relatively new. If the market is still
learning about the benefits of KM and the credibility of the MAKE awards, the short window returns around the MAKE announcement dates are not expected to fully anticipate MAKE winners’ superior future performance. Thus, we use a portfolio intercept test (Konchitchki, 2008) to test whether the MAKE winning firms report abnormally high stock returns following the announcement of the awards. We find that abnormal returns are significantly positive over a 12-month period following the award announcements. These findings are consistent with the market still learning that the MAKE awards identify firms that excel at KM and that KM leads to superior future performance.

Taken together, our results provide evidence that MAKE award winners experience an increase in shareholder value due to expected superior operating performance. To the extent that the MAKE awards provide market participants with new information about firms that excel at KM, our results are consistent with superior KM increasing shareholder value. These findings contribute to several streams of prior research. Importantly, our results are generally consistent with the long history of economics research that argues knowledge is a critical element in value creation. Our results are also consistent with an extensive body of literature that suggests superior KM practices improve firm performance. We also contribute to the stream of accounting literature that examines intangible assets. While prior research focuses primarily on the valuation implications of intangibles such as R&D and brand names (e.g., Lev and Sougiannis, 1996; Barth, Clement, Foster, and Kasznik, 1998), we focus on “knowledge-based

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6 We also note that our research adds to, but is distinct from, the research that investigates the valuation implications of transaction-oriented systems, such as enterprise resource planning (ERP) systems (e.g., Hayes, Hunton, and Reck, 2001; Hunton, Lippincott, and Reck, 2003). While transaction-based systems may facilitate KM activities, they are fundamentally different from KM, as noted in prior literature (Borghoff and Pareschi, 1998; McDermott, 1999; Wah, 1999; Gao, Li, and Clarke, 2008). KM is not transaction-oriented, focusing instead on issues related to knowledge creation, use and reuse. Nevertheless, while KM systems are distinct from transaction-based systems, KM is an issue that is also of interest to accounting systems researchers (e.g., Arnold and Sutton, 2002; Leech and Sutton, 2002).
assets,” intangibles that are conceptually and fundamentally different from R&D and brand names. While R&D pertains to a relatively well-defined activity within the firm (i.e., research), and brand name represents a relatively specific aspect of firm value (i.e., branding), knowledge-based assets are intrinsically related to all activities and sources of value within the firm. Thus, managing knowledge-based assets entails a much broader scope of activities compared with managing these other intangibles, and the benefits are potentially broader in scope.\(^7\)

In summation, our results provide the first systematic evidence consistent with superior KM practices increasing shareholder value. We emphasize, however, that we cannot generalize our results beyond our sample of MAKE winners. While we find evidence that the KM activities of MAKE winners create value for shareholders, our evidence does not suggest that implementing KM systems, \textit{per se}, necessarily leads to increased shareholder value. Whereas the firms in our sample exhibit superior KM practices, firms with poorly implemented KM systems are less likely to benefit. Indeed, there are well-documented instances in which KM initiatives are poorly designed and implemented (Malhotra, 2004). However, a normative evaluation of the costs and benefits associated with implementing KM is beyond the scope of this study. In addition, we do not suggest that our sample companies are the only firms that excel at KM. Although MAKE winners are chosen because they have superior KM practices, we do not expect them to be the only firms that excel at KM. Finally, we do not suggest that the market reaction to the MAKE winners represents the total net benefits from superior KM practices. Because firms have been investing in KM systems since the mid 1990’s, market participants should understand

\(^7\) We note that prior studies also examine the stock market reaction to awards such as the Malcolm Baldrige Award, and the J. D. Power and Associates Award (e.g., Hendricks and Singhal, 1997; Przasnyski and Tai, 2002; Balasubramanian, Mathur, and Thakur, 2005). This research generally uses these awards as surrogates for the successful implementation of product quality systems, typically in a manufacturing environment. The results of this prior literature are quite mixed, with some studies finding a significant reaction to the awards and other studies not finding a significant reaction to the awards. Importantly, the awards examined in these other studies surrogate for something very different from what we examine in our study. The MAKE awards are uniquely designed to gather expert opinions about firms that excel at KM.
that KM investments potentially improve shareholder value even in the absence of the MAKE award. The increase in stock price in reaction to the awards is consistent with investors attributing value to firms that excel at KM.

The next section discusses the motivation for the paper and Section III discusses the sample selection. Section IV presents our analysis and results, Section V presents sensitivity analysis, and section VI summarizes our conclusions.

II. MOTIVATION

Economic Foundations of Knowledge Management

Economists have acknowledged the economic importance of knowledge as early as Schumpeter (1934). Schumpeter (1934) observes that the process of combining and creating intellectual capital is the foundation for economic development, and this perspective has become the starting point for a large body of research. The economics literature that addresses knowledge creation and its applications has broadened into a large number of areas since Schumpeter (1934). At the firm level, Hayek (1945) observes “the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form, but solely as the dispersed bit of incomplete and frequently contradictory knowledge which all the separate individuals possess.” This observation emphasizes that a central problem in organizing firms is that knowledge is often widely distributed across individuals within the firm, which creates difficulties in coordinating firm activities. Importantly, Hayek (1945) also makes a distinction between “scientific knowledge”, defined as knowledge of facts, and “unscientific knowledge”, defined as “…the knowledge of the particular circumstances of time and place…special knowledge of circumstances of the fleeting moment, not known to others.” Hayek (1945) notes that scientific knowledge, or “information,” is a central concept in neoclassical economics,
where agents often possess perfect and identical information. But focusing solely on information, Hayek argues, greatly oversimplifies the task of explaining economic behavior because it ignores the central importance of unscientific knowledge.

Hayek’s dichotomy between scientific and unscientific information is similar to the distinction between “explicit” and “tacit” knowledge made in Polanyi (1966). Explicit knowledge is defined as knowledge that is documented (or can be easily documented) and easily communicated and interpreted. An example is an owners’ manual that accompanies the purchase of an electronic product (Alavi and Leidner, 2001). In contrast, tacit knowledge is obtained from experience and involvement in a specific context, and typically resides “in the heads” of individuals. This knowledge includes individuals’ mental models, beliefs, and viewpoints, and is inherently difficult to communicate (Nonaka, 1991). A simple example of tacit knowledge is the best means of approaching a particular customer: such as through flattery, hard sell, or a no-nonsense approach (Alavi and Leidner, 2001). Such knowledge can only derive from experience. Much of the KM literature focuses on creating and exploiting tacit knowledge. However, both tacit and explicit knowledge are related in that explicit knowledge can be used in the creation of tacit knowledge, and a primary objective of many KM systems it to turn tacit knowledge into explicit knowledge so that it can be shared and used to create tacit knowledge (Alavi and Leidner, 2001).8

Machlup (1962) is another important influence on the growth in KM and KM research. Machlup coined the term “knowledge economy” and is credited with being the first to document that the US economy is in the process of transitioning from primarily industrial-based to

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8 As with KM, there is no single accepted definition for “knowledge” as it is used in the context of KM. A commonly accepted definition is “…a state or fact of knowing, with knowing being a condition of understanding gained through experience or study” (Schubert et al., 1998). In this view, knowledge does not exist outside of individuals, and is the result of cognitive processing. Other definitions, however, suggest that knowledge is an object, which can be processed and stored (e.g., Carlsson, El Sawy, Eriksson, and Raven, 1996).
primarily knowledge-based. Importantly, Machlup (1962) argues that the factors for business success are fundamentally different in an industrial-based economy than in a knowledge-based economy: while industrial-based firms rely primarily on factors such as land, labor and natural resources, knowledge-based firms rely more heavily on factors such as intellectual capital, expertise, and know-how.

**Knowledge Management Research**

KM researchers tend to adopt a knowledge-based perspective of the firm, which originates in the strategic management literature (e.g., Nonaka and Takeuchi, 1995). This perspective argues that firms create value primarily from combining and applying resources through the use of firm-specific knowledge, which are termed knowledge-based assets, and which reside primarily with the firm’s employees. Knowledge-based assets are costly to imitate and therefore can provide the firm with a sustainable long-term competitive advantage. This literature also observes that the business environment is characterized by rapid shifts in product markets, high levels of competition, and fast changing technologies (Alavi and Leidner, 2001). Successful companies are those that are able to adapt by creating new products and embracing new technologies. A major implication of these arguments is that all business enterprises are essentially in the business of innovation, and success ultimately lies in a company’s ability to manage knowledge.\(^9\) Importantly, this means that a firm’s survival does not just depend on its knowledge at a particular point in time, but on its ability to create new knowledge, with this new knowledge fueling innovation (Nonaka, 1991). This view suggests that knowledge is renewable and can be systematically managed within the firm.

\(^9\) Nonaka (1991) argues that Honda, NEC, and Sharp are examples of such companies.
KM research has flourished over the last two decades and permeates a wide variety of academic business disciplines. Much KM research tends to use methodologies based on case studies and surveys. Case studies documenting the implementation of KM systems include many well-known companies, including Daimler Chrysler (Johnson, Rukstad, and Coughlin, 2001), Siemens (MacCormack, 2002), and British Petroleum (Berzins, Podolny, and Roberts, 1998). Some companies, such as KPMG, have case studies from multiple authors that have followed the evolution of the companies’ KM practices over many years (Gladstone and Eccles, 1991; Alavi, 1997; O’Leary, 2008). A major objective of much of the survey literature is to identify the factors associated with successful KM initiatives (e.g., O’Leary, 2001; Schultz and Jobe, 2001; Lee and Choi, 2003; Chuang, 2004; Kim and Lee, 2004). Based on a plethora of case studies in a variety of business areas, the KM literature presents strong anecdotal evidence that KM systems can significantly improve firm performance.

Research on Intangibles

Our study addresses whether the efficient use of knowledge assets improves shareholder value. Because knowledge-based assets are intangibles, the accounting research area that most closely relates to our study is the research that examines the valuation of intangibles. Most of the empirical research in this area addresses whether intangibles, such as brand names and R&D, are valued in the capital markets. This is an important issue because US GAAP is traditionally reluctant to allow capitalization of intangibles because of the belief their values are unreliable. While the evidence is somewhat mixed, many of these papers find support for the value relevance of intangibles. For example, Barth and Clinch (1998) examine whether intangible assets that are internally valued and included on the books of Australian firms are value relevant in the stock market. Australian GAAP allows firms to estimate and capitalize intangibles, and the majority of capitalized intangibles in their sample consists of brand names, patents, and licensing
agreements. They find that intangibles are indeed valued by the market. Similarly, Barth, Clement, Foster, and Kasznik (1998) also find evidence that brand name values are priced in the stock market and that brand names can be reliably estimated. Lev and Sougiannis (1996) examine whether the value of R&D can be reliably estimated from past financial information. They find evidence that R&D estimates can provide reliable and economically relevant information about the value of R&D expenditures.

Our study relates to an intangible asset that has not been previously examined in the accounting literature, “knowledge-based assets.” Importantly, knowledge-based assets are fundamentally different from intangibles that have been previously studied in the literature. The value derived from a brand name relates to a very specific aspect of value creation – the establishment and effective use of branding. Similarly, R&D expenditures pertain to a relatively well-defined activity within the firm – research. In contrast, knowledge-based assets permeate all functional area within the firm and hence can impact firm value on many dimensions. For example, while KM may include facilitating the exchange of ideas to improve the effectiveness of the firm’s branding activities or the innovativeness of its research, KM also includes systems designed to improve production efficiency and customer relations. Thus, managing knowledge-based assets entails a much broader scope of activities when compared to managing other intangibles, and the benefits are more wide-ranging.

III. SAMPLE SELECTION

MAKE winners are chosen by panels of KM experts with balanced membership from publicly held companies, privately held companies, and not-for-profit organizations. Each panel has 750 to 3,000 members, comprised of leading KM experts, executives from Fortune 500 companies, and organizational learning experts, with no more than four panelists from any one
organization (Asian Productivity Organization, 2007; Chase 2007). The panelists identify MAKE winners using the Delphi method, a mechanism developed by the Rand Corporation for seeking consensus decisions among experts (Dalkey, 1969). The objective of the Delphi method is to aggregate the divergent beliefs of the individual experts and converge on a single collective decision. The process typically consists of three or four “rounds” of anonymously sharing the experts’ views among themselves, where the experts’ identities are not revealed to one another.

In the first round, the panelists are asked to nominate organizations (public, non-public, or not-for-profit) based on eight criteria that are indicators of companies that excel at KM. As explained more fully in Appendix A, these criteria are:

1. Creating a knowledge-driven enterprise culture.
2. Developing knowledge workers through senior management leadership.
3. Delivering knowledge-based products/services/solutions.
4. Maximizing enterprise intellectual capital.
5. Creating an environment for collaborative knowledge sharing.
6. Creating a learning organization.
7. Creating value based on customer knowledge.
8. Transforming enterprise knowledge into organizational wealth.

The panelists are asked to provide information to support their nominations, including personal experiences and case study evidence. The first round typically results in the selection of 50 to 150 organizations. In the second round, the first round choices and supporting explanations are anonymously shared among the panelists. The panelists are asked to evaluate the new information received from the other experts, then create a short list of no more than three organizations (again based on the eight criteria). Firms that are short-listed by 10% or more of the panelists are included in the third round. In the third round the panelists are asked to formally score each of the finalists on a Likert scale from one to ten based on the eight criteria listed above. The scores are equally weighted across the eight categories and the firms with the highest
scores are selected as the winners. The winning organizations typically have scores ranging
between seven and nine on each of the eight criteria.

MAKE winners are announced through emails to the KNOW Network members,
followed by the issuance of a public press release. The winners are announced by geographical
region periodically throughout the year, with no pre-determined announcement dates.\textsuperscript{10} Winners
include a variety of organizations, including public corporations, government entities, non-public
business enterprises, and not-for-profit organizations. We begin our data collection by searching
the Factiva and Lexis-Nexis databases for news announcements of the MAKE winners. This
search identifies 425 MAKE winners, with the earliest winners announced during 2001.\textsuperscript{11} After
excluding MAKE winners that do not have data in the CRSP database (primarily non-listed
companies such as Ernst & Young and not-for-profit companies such as NASA), we reduce our
sample to 222 observations. We then obtain press release dates directly from Teleos for another
25 publicly traded MAKE winners that we cannot identify in the Factiva and Lexis-Nexis
databases.\textsuperscript{12} This process results in a final sample of 247 MAKE awards issued to 46 distinct
companies from 2001 through 2008.

Table 1 provides descriptive statistics of the MAKE award-winning firms by industry and
year. Panel A presents the number of MAKE awards by industry (based on the industry
classifications in Fama and French, 1997). Firms in Business Services have the largest number of
MAKEs, with 27\%, followed by Computers and Automobiles & Trucks with 13\% each. Firms in

\textsuperscript{10} MAKE awards are issued by various geographic regions (e.g., North America, Asia, and Europe) as well as an
overall global award. Thus, firms may win more than one MAKE award per year if they win an award in their
geographic region and a global award.

\textsuperscript{11} The KNOW Network website report that the first MAKE award was announced in 1998, but we find no news
announcements prior to 2001. Thus, we begin our sample with the 2001 awards.

\textsuperscript{12} Teleos issues a press release publicly announcing the MAKE winners. To establish the validity of the press release
dates obtained directly from Teleos, we compare the dates of the MAKE announcements of a sample of 97 Teleos
press releases for which we also have news announcements and find that the Teleos dates match the news
announcement dates in all but three cases, and in those cases the press release dates are within one day of the news
announcement dates.
the Electronic Equipment industry have the third largest number of MAKEs, with 11%, and firms in the Petroleum and Natural Gas industry have the fourth largest number of MAKEs with 10%. Appendix B includes a description of KM systems introduced at Siemens (a firm in the Electronic Equipment industry), and British Petroleum (a firm in the Petroleum and Natural Gas industry). The remaining industries receive 5% or less of the awards. Panel B of Table 1 lists the number and percentage of MAKE winners in our sample by year, and indicates that the number of MAKE winners increases over time.

Table 2 lists descriptive statistics for our distinct MAKE winning firms using data from the Compustat database. We report statistics on each sample firm based on their average values over the period 2001-2008, equally-weighted by firm. Table 2 reports that the sample firms tend to be reasonably large, with median assets of over $34 billion and median sales of over $8 billion. Our sample firms are also financially healthy, with median ROA of 1.9%, median ROE of 4.7%, and median cash flows-to-assets of 8.5%.

IV. ANALYSES AND RESULTS

Stock Market Reaction to Winning a MAKE Award

Our first analysis tests our prediction that the stock market reacts positively to the announcement of the MAKE winners. As in DeFond, Hann, and Hu (2005), we test our prediction using standard event-study methodology with cumulative abnormal returns (CAR) computed over a five-day event window, beginning two days before the announcement through two days after the announcement day (e.g., Binder, 1998). We employ a five-day window because the MAKE awards are announced to members of the KNOW Network via email a day or two prior to the official press release date, which suggests news of the awards may be leaked prior to the official announcement date. In addition, the MAKE awards are relatively new and
the benefits of KM may be relatively unclear to market participants, suggesting that market participants may be slow to react to the announcement of the winners. Specifically, we compute CAR as follows:

\[
\text{CAR}_{[-2,+2]} = \sum_{t=-2}^{t=+2} \overline{AR}_t
\]  

(1)

where:

\[
\overline{AR}_t = \frac{1}{N_t} \sum_{i=1}^{N_t} AR_{it}; \quad AR_{it} = R_{it} - E(R_{it}) \; \text{and} \; t = (-2, -1, 0, +1, +2);
\]

\[
R_{it} \text{ is the return of the sample firm } i \text{ on day } t;
\]

\[
E(R_{it}) \text{ is the corresponding market return from CRSP on day } t.
\]

We report two t-statistics that test the statistical significance of the CAR, one using the time-series mean abnormal returns as in Brown and Warner (1980, 1985), and the other using the calendar-time abnormal returns as in Jaffe (1974) and Mandelker (1974). The t-statistics using the time-series approach are computed as follows:

\[
t = \frac{\sum_{t=-2}^{t=+2} AR_t}{\left( \sum_{t=-2}^{t=+2} S^2[\overline{AR}_t] \right)^{1/2}}
\]  

(2)

where:

\[
S^2[\overline{AR}_t] = \left( \sum_{t=-6}^{t=+6} \left[ \overline{AR} - \overline{AAR} \right]^2 \right) / 238; \quad \overline{AAR} = \sum_{t=-244}^{t=-239} \overline{AR}_t / 239.
\]

We use 239 days (-244 through -6) in the estimation period to derive the standard deviation and restrict the analysis to firms with at least 120 daily returns in the estimation period. Because a portfolio average abnormal return is used in the calculation of the standard deviation, the test statistic takes into account cross-sectional dependence in the abnormal returns.

To implement the calendar-time test we first sort all firms into portfolios by event calendar date. Next we estimate a portfolio standard deviation from the time series of portfolio abnormal returns in the estimation period, and used it to standardize the portfolio return. Our
calendar-time p-value from this test is based on a cross-sectional t-test on the standardized portfolio abnormal return. We calculate the calendar-time t-statistic as follows:

\[ t = \frac{CAAR_{[-2,+2]}}{\left( \frac{S^2_{CAAR_{[-2,+2]}}}{\sqrt{N}} \right)} \]  

(3)

where:

\[ S^2_{CAAR_{[-2,+2]}} = \frac{1}{N-1} \sum_{i=1}^{N} \left[ \sum_{t=-2}^{2} AR_i \right]^2 - \frac{1}{N} \sum_{j=1}^{N} \left( \sum_{t=-2}^{2} AR_j \right)^2 \]; \[ CAAR_{[-2,+2]} = \frac{1}{N} \sum_{j=1}^{N} \left( \sum_{t=-2}^{2} AR_j \right) \]; and \( i, j \) are firm indices.

Table 3 reports the results of the stock market reaction analysis. Consistent with our prediction, we find a positive portfolio mean abnormal return for the MAKE winners of 1.25%, which is significant at \( p = 0.042 \) using the time-series abnormal return t-statistic from Brown and Warner (1980, 1985), and at \( p = 0.029 \) using the calendar-time abnormal return t-statistic from Jaffe (1974) and Mandelker (1974). To assess the economic significance of our findings, we evaluate the impact of the market reaction to the MAKE award. Evaluated at the mean and median market value of equity for our sample firms of $72,066 and $50,191 million (see Table 2), our findings are consistent with an increase in market value of $900.8 and $627.4 million per sample firm, respectively. Overall, our findings are consistent with the MAKE awards providing new information about which firms excel at KM, and with market participants expecting firms that excel at KM to exhibit superior future operating performance.

The Association between the Market Reaction to Winning a MAKE Award and Future Performance

Our second analysis tests our prediction that the abnormal returns around the MAKE award announcements are associated with superior future performance. We assess future performance using three accounting-based performance measures: ROA, ROE, and CFO. Each

\[ 13 \quad \text{Significance levels are one-tailed where we have predictions and two-tailed otherwise.} \]
measure is averaged over the four quarters following the quarter in which the MAKE award is received, with data obtained from the Compustat Quarterly database. We use the average of all available quarters for the MAKE winners with less than four quarters of available data following the receipt of the award. We then regress each of the future performance measure on the cumulative abnormal stock returns during the five days surrounding the announcement of the MAKE winners, using two models as follows:

\[ Model 1: \text{FuturePerformance}_{if} = \alpha_i + \beta_1 \text{CAR}_{it} + \varepsilon_{if} \]  

\[ Model 2: \text{FuturePerformance}_{if} = \alpha_i + \beta_1 \text{CAR}_{it} + \beta_2 \text{ExpectedPerformance}_{if} + \varepsilon_{if} \]

where:

\( \text{CAR}_{it} \) = Cumulative abnormal return for firm \( i \) over period \( t \), which equals the five days surrounding the award announcement day (day -2 through day +2).

\( \text{FuturePerformance}_{if} \) = ROA, ROE, or CFO, for firm \( i \), over future period \( f \). Period \( f \) refers to the average of the future four quarters following the quarter in which the MAKE award is received.

\( \text{ExpectedPerformance}_{if} \) = Analyst expectations of future ROA, ROE or ROA, for firm \( i \), over future period \( f \).

We include expected future performance in our second model to control for market expectations of future performance at the time the awards are announced. Thus, Model 2 tests whether the MAKE awards reflect information about future performance that is incremental to the market’s expectations just prior to the award announcement. We operationalize expected future return on assets and future return on equity as the I/B/E/S consensus annual earnings per share forecast divided four (because our dependent variable is average quarterly performance), scaled by total assets per share and by stockholders’ equity per share, respectively. We operationalize analyst expectations of future cash flows from operations as the I/B/E/S consensus analyst forecast of annual cash flows from operations per share divided by four (because our dependent variable is average quarterly performance), scaled by total assets per share. We measure total assets and stockholders’ equity during the quarter in which the MAKE award is
announced or, in the case of missing data, the quarter with data immediately before the MAKE winning quarter. Also, because some firms win multiple awards over the period of our analysis, we cluster the regression residuals by firm and year to control for potential cross-sectional and time-series correlation (Petersen, 2008; Gow, Ormazabal, and Taylor, 2009). A positive and significant coefficient on $\beta_1$ is consistent with our expectation that the event period abnormal stock returns are associated with higher expected future performance.

Table 4 presents the results of estimating the two models for the three performance measures. The number of observations in this analysis drops to 202 (from the 247 in our event study test) for Model 1 primarily because the 37 MAKE winners in 2008 (see Table 1, Panel B) received their awards in October and November 2008, and we lack future performance variables for these observations.\textsuperscript{14} Because analyst forecast data are not available in I/B/E/S for all 202 firms, there is a slight loss of observations for estimating Model 2 (195 for ROA and ROE, and 170 for CFO). Consistent with our prediction, Table 4, Panel B, reports that for Model 1 the coefficient on CAR is significant at $p = 0.026$ or less for all three future performance measures. That is, all three regressions find a positive and statistically significant association between future operating performance for the MAKE winners and abnormal stock returns around the announcement of the MAKE awards. Table 4, Panel B, also reveals that when investigating Model 2 the coefficient on CAR is significant for future ROA ($p = 0.009$) and ROE ($p = 0.001$), but not for CFO ($p = 0.378$).

Taken together, our findings in Table 4 corroborate the findings in our first analysis by providing evidence that the positive stock market reaction to the MAKE award announcements is due to the market’s expectation that the MAKE winners will exhibit superior future performance.

\textsuperscript{14} We also delete 3 observations without past performance data required for our analysis in Table 4. This exclusion does not change our inferences as we explain in Section V.
Because we expect the MAKE awards to identify firms with superior KM abilities, this is consistent with the market expecting firms that excel at KM to exhibit superior operating performance.

**Future Performance of MAKE Award Winners Compared to their Peers**

Because the MAKE awards are expected to identify firms with superior KM abilities, we expect the MAKE winners to outperform their peers, on average, subsequent to the receipt of the award. We investigate this by comparing the MAKE winners’ performance with the performance of two sets of peer firms. The first set of peers contains all of the other firms in the MAKE winners’ industry during the quarter in which the MAKE is awarded. The second set of peers is more narrowly matched, consisting of the portfolios of all of the firms that are in both the industry and the percentile of total assets of the MAKE winners during the quarter in which the MAKE is issued.\(^{15}\) We compare the performance of the winner and peer firms based on the three performance measures we use in Table 4 (ROA, ROE, and CFO). Because the first peer group is matched only on industry, we compare the MAKE winners with this group by estimating the following regression model that adds control variables capturing past performance, total assets, and the book-to-market ratio:

\[
FuturePerformance_{it} = \alpha_i + \beta_1 Winner_{it} + \beta_2 PastPerformance_{it} + \beta_3 Assets_{it} + BTM_{it} + \varepsilon_{it} \tag{5}
\]

where:

- \(FuturePerformance_{it}\) = ROA, ROE, and CFO, for firm \(i\), over period \(t\), which equals the average of the four quarters following the quarter in which the MAKE award is received. Where four quarters are not available we use all available quarters.
- \(Winner_{it}\) = An indicator variable indicating the observation is a MAKE winner.
- \(PastPerformance_{it}\) = Similar to the future performance measures but captured over the four quarters prior to the quarter in which the MAKE is awarded. Where four quarters are not available we use all available quarters.

\(^{15}\) We use the industry classification in Campbell (1997) for this analysis because it contains fewer industries than the 48 Fama-French industries, thereby facilitating our identification of matched firms when we also match on percentile of total assets.
Assets\textsubscript{it} = Total assets from Compustat measured during the quarter in which the MAKE is awarded. When quarterly Compustat data is missing, we use the most recent quarterly or annual data prior to the quarter in which the MAKE is awarded.

BTM\textsubscript{it} = Book-to-Market ratio from Compustat measured during the quarter in which the MAKE is awarded. When quarterly Compustat data is missing, we use the most recent quarterly or annual data prior to the quarter in which the MAKE is awarded.

We cluster the regression residuals by firm and year to control for potential correlations among the error terms. We include control variables for past performance, size, and the book-to-market ratio because these variables are potentially related to future operating performance. A significantly positive coefficient on the dummy variable capturing MAKE winners is consistent with the MAKE winners outperforming the matched peer firms over the quarters following the announcement of the MAKE award.

Table 5 presents the results of this analysis, where we analyze the same 202 MAKE winning observations we use in Model 1 of Table 4. Panel A presents descriptive statistics for the 202 MAKE winner observations used in the analysis, Panel B presents descriptive statistics for the 51,033 peer firms matched on industry alone, and Panel C presents descriptive statistics for the 202 peer firm portfolios matched on industry and percentile of total assets. Panel A indicates the mean future ROA, ROE, and CFO is 2.9%, 6.2%, and 10.1%, respectively, for the 202 MAKE winning observations. Comparing this with the past ROA, ROE and CFO on 2.9%, 5.9%, and 10.2%, indicates that performance is highly persistent. Panel B indicates that the peer firms matched on industry alone are smaller and perform more poorly when compared to the MAKE winners. In addition, the book-to-market ratios of the peer firms tend to be larger than for the MAKE winners. Panel C indicates the peer firms matched on industry and size yields a significantly closer match to the MAKE winners in Panel A. In particular, these matched firms are much larger and more profitable than the peers matched on industry alone.
Panel D of Table 5 presents the regression analysis comparing the MAKE winners with the peer sample matched on industry alone. The results report a positive coefficient on the dummy capturing MAKE winners in all three regressions, with a significance of $p \leq 0.001$. Thus, we find that when compared to the peers in their industry, the MAKE winners report significantly higher future performance, after controlling for past performance, size, and the book-to-market ration. Panel E presents a univariate analysis of the peer group matched on industry and size. This analysis indicates that mean and median performance, across all three performance measures, is higher among the MAKE winners than among the peers, with a significance of $p \leq 0.001$. Thus, the analysis in Table 5 is consistent with the MAKE awards identifying firms that outperform their peers subsequent to receiving the MAKE award. This is consistent with the MAKE awards identifying firms that excel at KM and with firms that excel at KM outperforming their peers.

**Analyst Earnings Forecast Revisions following MAKE Award Announcements**

Equity analysts are financial intermediaries that are potentially interested in the valuation implications of the MAKE awards. Thus, in addition to investigating the stock market’s reaction to the announcement of the MAKE awards, we also investigate equity analysts’ reaction. We predict that equity analysts make upward revisions to their annual earnings forecasts for the MAKE award winners during the month following the announcements. Finding that equity analysts make upward revisions to their forecasts in response to the awards is consistent with the awards providing analysts with new information about the award winners’ expected future performance.

We perform four analyses to test the reactions of analysts to the MAKE award announcements. Our first analysis tests whether the consensus forecast revision for the MAKE winners is significantly positive during the month following the MAKE award. If the MAKE
awards provide new information about improved future performance, we expect to find a positive average consensus forecast revision. We compute the average consensus forecast revision for each MAKE award winner as follows, where time $t = 0$ is the month during which the award is announced:

$$\frac{\text{Consensus EPS Forecast}_{t+1} - \text{Consensus EPS Forecast}_{t, t}}{\text{Consensus EPS Forecast}_{t, t}}$$  \hspace{1cm} (6)$$

Table 6, Panel A, reports the results of this test. This analysis restricts our sample to observations with consensus forecasts in the I/B/E/S database, which reduces our sample to 183 observations.\(^{16}\) Panel A indicates that the mean consensus forecast revision is +2.8% and significant at $p = 0.027$. Thus, we find that the consensus forecast revision during the month following the MAKE awards is positive and statistically significant for the winners.

Our second analysis tests whether the average number of upward earnings forecast revisions is larger than the average number of downward earnings forecast revisions for the MAKE winners during the month following the announcement of the award. If the MAKE awards provide new information about improved future performance, we expect to find significantly more upward revisions than downward revisions. Using the I/B/E/S database, we compute the averages as the total number of upward and downward revisions for all observations with available data, divided by the number of MAKEs awarded to the firms with available data. Specifically, we calculate the following two ratios, where time $t$ is the month of the award:

$$\text{Measure 1} = \frac{\text{Number of Upward Revisions}_{t+1}}{\text{Number of Awards}}$$

$$\text{Measure 2} = \frac{\text{Number of Downward Revisions}_{t+1}}{\text{Number of Awards}}$$  \hspace{1cm} (7)$$

\(^{16}\)Note that the forecasted annual earnings during the month prior to the MAKE must also be for the same year as the forecast during the month subsequent to the MAKE. This restriction results in dropping seven observations.
Table 6, Panel B, reports the results of this test. This analysis requires I/B/E/S data from the month following the award month, and also restricts the MAKE sample to firms with either an upward or downward forecast revision. This increases our sample to 190 observations. Panel B indicates that an average of 3.04 analysts per MAKE winner revise upwards (Measure 1), and an average of 1.90 analysts per MAKE winner revise downwards (Measure 2), and that the average number of upward revisions is significantly greater than the average number of downward revisions at $p = 0.009$. Thus, we find that the average number of upward forecast revisions is larger than the average number of downward forecast revisions for the MAKE award winners during the month following the announcement of the award.

Our third analysis tests whether the proportion of analysts making upward revisions is greater than fifty percent of the total analyst revisions during the month following the announcement of a MAKE award. If the MAKE awards provide new information about improved future performance, we expect to find the proportion of upward revisions to be significantly higher than fifty percent for the MAKE winning firms. Using all observations with available data in I/B/E/S, we compute the proportion of upward revisions for each MAKE award winner as follows, where time $t$ is the month of the award:

$$\frac{\text{Number of Upward Revisions}_{t+1}}{\text{Total Number of Upward or Downward Revisions}_{t+1}}$$  \hfill (8)

Table 6, Panel C, reports the results of this test. This analysis contains the same sample we analyze in Panel B. Panel C indicates that the mean proportion of upward forecast revisions relative to total revisions is 59.4%, and it is significantly greater than 50% at ($p = 0.002$). Thus, this finding is consistent with a significantly higher proportion of analysts revising their forecasts upward for MAKE winners during the month following the winning of the award.
Our fourth test investigates analyst forecast revisions of MAKE firms relative to a control sample. We first match each MAKE award observation with a matched portfolio of firms in the same industry, year, quarter, and percentile of total assets, where each portfolio contains an average of 6.4 matched peer firms. Next we calculate the revisions in analyst consensus EPS forecasts over three periods surrounding the award month: month –1 relative to month –3 (–3, –1), month +1 relative to month –1 (–1, +1), and month +3 relative to month +1 (+1, +3), where the award month is defined as month = 0. We scale the analyst EPS forecast revisions by the analyst consensus EPS forecast from the first month of each period and winsorize at the first and ninety-ninth percentile for both the MAKE firms and the peer portfolios. We then compute the mean and median of the scaled revisions, and conduct a two-sample t-test and a two-sample Wilcoxon z-test to compare the means and medians, respectively, between the MAKE firms and the matched control portfolios.

Table 6, Panel D, reports the results of this test. The first three rows show the mean and median revisions during each of our revision windows for the MAKE firm observations. This portion of Panel D indicates that during (–1, +1) the revisions are significantly positive, with mean and median values of 0.033 (p = 0.024) and 0.004 (p = 0.001), respectively. In addition, the revisions during (+1, +3) are significantly positive for the median, with a value of 0.005 (p = 0.005). The next three rows in Panel D show the mean and median revisions during each of our revision windows for the matched portfolios. This analysis indicates that the mean and median revisions are insignificant at conventional levels during all three windows. The last three rows show the differences in the mean and median revisions between the MAKE firm observations and the matched portfolios. This analysis finds that during the (–1, +1) window the mean and median MAKE firms’ revisions are significantly higher than the matched portfolios’ revisions, with values of 0.033 (p = 0.035) and 0.013 (p = 0.021), respectively. In addition, during the (+1,
+3) window, the MAKE firms’ revisions are significantly higher than the matched portfolios’ revisions for the median, with a value of 0.009 (p = 0.019). Thus, Panel D reveals that equity analysts make significantly larger upward revisions to MAKE winners than to their control peers during the months immediately surrounding the award announcement month.

In summary, for MAKE winners during the month following the award announcement:

1. analysts make significant upward revisions to their forecasts;
2. the average number of upward analyst forecast revisions is larger than the average number of downward revisions;
3. the proportion of upward analyst forecast revisions is significantly larger than 50%; and
4. analysts’ revisions for MAKE winners are significantly higher than for their peers. Taken together, these findings present evidence that the MAKE awards communicate information to equity analysts indicating the winners will exhibit higher future performance than previously anticipated. Because we expect the MAKE awards to identify firms with superior KM abilities, this is consistent with equity analysts expecting firms that excel at KM to exhibit superior operating performance.

**Subsequent Abnormal Stock Returns of MAKE Award Winners**

It is only relatively recently that companies have begun to make large investments in KM, and the MAKE awards are relatively new. Therefore the market may still be learning about the benefits of KM and the credibility of the MAKE awards. If so, the market may not impound all of the value relevant information about the award winners around the announcement date. If so, and if the MAKE winners outperform their peers, we expect abnormally high stock returns for the MAKE winners to persist subsequent to the announcement of the awards, as the market learns of their superior performance. Thus, our final analysis examines the risk-adjusted one-year-ahead returns of the MAKE winners.
We examine the subsequent stock market performance of the MAKE winners using an asset pricing test that examines the Fama-French intercepts (alphas) from a monthly time-series model for MAKE portfolios (e.g., Fama and French, 1993; Konchitchki, 2008; Barth, Konchitchki, and Landsman, 2009). Specifically, we form portfolios on July 1st of each sample year that consists of all MAKE winners during the preceding twelve months. Figure 1 presents a timeline for the construction of our portfolios relative to the announcement of the MAKE winners. We then regress the monthly portfolio returns during the subsequent twelve months on the three Fama-French factors, excess return on the market (MKT), small-minus-big (SMB), high-minus-low (HML), and a momentum factor (MOM). Specifically, we estimate the following model:

\[(Ret - R_f)_{pm} = \alpha_p + \beta_1MKT + \beta_2SMB + \beta_3HML + \beta_4MOM + \varepsilon_{pm}\]  

where:

\((Ret - R_f)_{pm}\) = Month \(m\) equally-weighted return in excess of the one month Treasury Bill, \(R_f\), to portfolio \(p\) formed each July 1st and includes all MAKE winners in our sample during the preceding 12 months.

\(MKT\) = the monthly return on the stock market minus the return on the one month Treasury Bill.

\(SMB\) and \(HML\) = the respective monthly return to the size (Small-Minus-Big) and book-to-market (High-Minus-Low) factor mimicking portfolios as described in Fama and French (1993).

\(MOM\) = the monthly return to the momentum factor mimicking portfolio (Jegadeesh and Titman, 1993; Carhart, 1997).

A significantly positive intercept in this regression indicates the MAKE winners report abnormal stock returns over the year following the MAKE awards.

Table 7 presents the results of this analysis. The sample size is 90 observations, corresponding to the number of months in the analysis (6 months of returns for 2001, and 12 months of returns for 2002-2008). We find that the coefficient on the intercept is 0.9% and significant at \(p = 0.005\). This finding indicates that MAKE winners continue to experience
abnormal stock returns, on average, during the year following the announcement of the MAKE award. This is consistent with the market not fully impounding the information about the awards around the award announcement date.

V. SENSITIVITY TESTS

Alternative Analysis of Abnormal Short Window Returns

We repeat the analysis in Table 3 using firm-level instead of portfolio-level returns. In untabulated tests we continue to find significantly positive abnormal returns during the five-day window centered on our MAKE award days. Thus, our interpretation from our analysis in Table 3 remains unchanged using this alternative measure of returns.

We also investigate the robustness of our inferences to the choice of the statistical tests we use to examine the stock market reaction in Table 3. Specifically, instead of the time-series and calendar-time t-tests we use to calculate the p-values, we use the standardized abnormal return Z-test following Patell (1976), which estimates a separate standard error for each security-event and assumes cross-sectional independence. The second measure is the nonparametric generalized sign test that, instead of assuming a probability for a positive abnormal return of half, adjusts for the fraction of positive versus negative abnormal returns in the estimation period. In untabulated analysis we continue to find a significantly positive stock market reaction to the MAKE award. Thus, our inferences in Table 3 remain unchanged using these two alternative tests.

Alternative Analysis of Future Performance

The analysis in Table 5, Panel E, is currently a univariate test. We test the robustness of this analysis by repeating it using the regression specification we use in Table 5, Panel D. Specifically, we regress future performance for our sample of MAKE winners and peer firm
portfolios (matched on industry and same percentile of total assets), on an indicator variable for MAKE winners, past performance, total assets, and the book-to-market ratio. In untabulated analysis we find a significantly positive coefficient on the MAKE winner indicator variable.

Thus, our inferences in Table 5, Panel E, remain unchanged using a multivariate analysis.

We also test the sensitivity of our results in Table 5, Panel D, and the alternative regression specification of Table 5, Panel E (described above), to the inclusion of past performance by repeating the regression analysis after omitting the past performance variable. In untabulated analysis we find that the coefficient on the indicator variable for MAKE winners remains significant and positive in both specifications. Thus, our inferences regarding multivariate analysis of Table 5, Panels D and E are unchanged when we drop past performance from the analysis.

**Alternative Specification for Future Returns**

We repeat our future return tests in Table 7 using the Fama-French three-factor model (i.e. after dropping the momentum factor). In untabulated analysis we find that the coefficient on the intercept remains significant at the $p < 5\%$ level. Thus, our interpretation from our analysis in Table 7 remains unchanged with this alternative specification.

**VI. SUMMARY AND CONCLUSIONS**

A long history of economic research suggests that knowledge plays a critical role in wealth creation. Recently, factors such as advances in technology and increased global competition have resulted in large increases in firms’ expenditures on KM systems. In addition, a large body of literature across several business disciplines presents case study evidence that firms with superior KM abilities outperform their peers. However, despite the trend towards greater investment in KM, and the theoretical and anecdotal evidence that KM improves performance, we are unaware
of any systematic evidence that KM results in higher shareholder values. Thus, the purpose of this study is to test whether superior KM abilities increases shareholder value by examining the stock market reaction and future performance of companies receiving the “Most Admired Knowledge Enterprise” (MAKE) award, which recognizes companies with superior KM abilities.

We perform tests that examine the share price reaction to the announcement of the MAKE award, the link between the share price reaction and future performance, analysts’ reaction to the announcement of the award, the future operating and stock price performance of the award winners. We find that during the five days surrounding the award announcement, MAKE winners experience 1.25% abnormal stock returns, and that these returns are positively associated with MAKE winners’ subsequent operating performance. We also find that equity analysts are relatively more likely to make significant upward revisions to MAKE winners’ earnings forecasts during the month following the award, and that MAKE winners surpass their peers in terms of both operating performance and stock price performance during the year subsequent to winning the award. All told, our findings are consistent with firms that excel at KM improving shareholder wealth through superior future operating performance. These findings are consistent with economic theory that argues knowledge is a fundamental driver of firm value, and with the KM literature in a variety of business disciplines that alleges superior KM systems provide firms with a competitive advantage.
REFERENCES


Chase, R. 2007. Speech by Rory Chase, Executive Director of Teleos and The KNOW Network.


Panel A reports the number of MAKEs awarded from 2001-2008 by industry for firms with available CRSP data, where industries are based on the Fama French (1997) 48 industry classification method. Panel B reports the number of MAKE awards by year.

### Panel A: MAKE Awards by Industry

<table>
<thead>
<tr>
<th>Industry</th>
<th>MAKEs Awarded</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Services</td>
<td>66</td>
<td>27</td>
</tr>
<tr>
<td>Computers</td>
<td>33</td>
<td>13</td>
</tr>
<tr>
<td>Automobiles and Trucks</td>
<td>32</td>
<td>13</td>
</tr>
<tr>
<td>Electronic Equipment</td>
<td>28</td>
<td>11</td>
</tr>
<tr>
<td>Petroleum and Natural Gas</td>
<td>24</td>
<td>10</td>
</tr>
<tr>
<td>Consumer Goods</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>Recreational Products</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Construction</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Medical Equipment</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Banking</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Pharmaceutical Products</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Steel Works, Etc.</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Chemicals</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Machinery</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Nonmetallic Mining</td>
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<td>1</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Transportation</td>
<td>1</td>
<td>&lt;1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>247</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

### Panel B: MAKE Awards by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>N</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>2001</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>2002</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>2003</td>
<td>22</td>
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<td>2004</td>
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<td>2005</td>
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<td>17</td>
</tr>
<tr>
<td>2006</td>
<td>47</td>
<td>19</td>
</tr>
<tr>
<td>2007</td>
<td>38</td>
<td>15</td>
</tr>
<tr>
<td>2008</td>
<td>37</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>247</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Table 2. Descriptive Statistics

Descriptive statistics for distinct MAKE award winning firms with available Compustat data. All statistics are equally-weighted by firm, and dollar amounts are in millions. There are 46 distinct MAKE firms. Variable definitions: Stockholders’ Equity (Compustat item SEQQ), Net Income (Compustat item NIQ), Total Assets (Compustat item ATQ), Sales (Compustat item SALEQ), Cash Flows from Operations (Compustat item OANCFY), Book-to-Market (Compustat items SEQQ/(PRCCQ*CSHOQ)), Return on Assets (Compustat items NIQ/ATQ), Cash Flows from Operations over Total Assets (Compustat items OANCFY/ATQ), and Return on Equity (Compustat items NIQ/SEQQ).

<table>
<thead>
<tr>
<th>Variable Description</th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
<th>25th Percentile</th>
<th>75th Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stockholders’ Equity ($MM)</td>
<td>24,032</td>
<td>16,620</td>
<td>25,769</td>
<td>5,650</td>
<td>33,066</td>
</tr>
<tr>
<td>Net Income ($MM)</td>
<td>1,080</td>
<td>706</td>
<td>1,117</td>
<td>229</td>
<td>1,361</td>
</tr>
<tr>
<td>Total Assets ($MM)</td>
<td>121,925</td>
<td>34,396</td>
<td>271,851</td>
<td>14,367</td>
<td>95,482</td>
</tr>
<tr>
<td>Sales ($MM)</td>
<td>15,613</td>
<td>8,574</td>
<td>17,553</td>
<td>3,890</td>
<td>22,958</td>
</tr>
<tr>
<td>Cash Flows from Operations ($MM)</td>
<td>4,830</td>
<td>2,706</td>
<td>7,207</td>
<td>882</td>
<td>5,995</td>
</tr>
<tr>
<td>Market Value of Equity ($MM)</td>
<td>72,066</td>
<td>50,191</td>
<td>71,853</td>
<td>21,214</td>
<td>85,663</td>
</tr>
<tr>
<td>Book-to-Market</td>
<td>0.379</td>
<td>0.291</td>
<td>0.245</td>
<td>0.215</td>
<td>0.494</td>
</tr>
<tr>
<td>Return on Assets</td>
<td>0.024</td>
<td>0.019</td>
<td>0.020</td>
<td>0.009</td>
<td>0.038</td>
</tr>
<tr>
<td>Cash Flows from Operations/Assets</td>
<td>0.092</td>
<td>0.085</td>
<td>0.054</td>
<td>0.050</td>
<td>0.130</td>
</tr>
<tr>
<td>Return on Equity</td>
<td>0.065</td>
<td>0.047</td>
<td>0.084</td>
<td>0.028</td>
<td>0.075</td>
</tr>
</tbody>
</table>
Table 3. Market Reaction to Announcement for 247 MAKE Award Winners

Portfolio abnormal returns are the five-day cumulative abnormal returns surrounding the announcement day for 247 MAKE award winners using standard event study methodology (Binder, 1998). The CARs are computed as follows:

\[
CAR_{t-2,t+2} = \sum_{i=2}^{t+2} AR_i, \quad \text{where:} \quad AR_i = \frac{1}{N} \sum_{j=1}^{N} AR_{ij}; \quad AR_{ij} = R_{ij} - E(R_{ij}); \quad \text{and} \quad t = (-2, -1, 0, +1, +2); \quad R_{ij} \text{ is the return of the sample firm } i \text{ on day } t; \quad \text{and } E(R_{ij}) \text{ is the corresponding market return from CRSP on day } t.
\]

P-values are based on t-statistics computed using the time-series mean abnormal returns as in Brown and Warner (1980, 1985), and the calendar-time abnormal returns as in Jaffe (1974) and Mandelker (1974). We calculate the time-series t-statistic as follows:

\[
t = \sum_{i=2}^{t+2} AR_i / \left( \sum_{i=2}^{t+2} S^2[AR_i] \right)^{1/2}, \quad \text{where:} \quad S^2[AR_i] = \frac{\sum_{t=244}^{t=244} (AR_t - \overline{AR})^2}{238}; \quad \overline{AR} = \sum_{i=2}^{t=244} AR / 239.
\]

We calculate the calendar-time t-statistic as follows:

\[
t = CAAR_{t-2,t+2} / \left( S_{CAAR_{t-2,t+2}} / \sqrt{N} \right), \quad \text{where:} \quad S^2_{CAAR_{t-2,t+2}} = \frac{1}{N-1} \sum_{i=1}^{N} \left( \sum_{j=2}^{j=2} AR_{ij} \right)^2 - \frac{1}{N} \sum_{i=1}^{N} \left( \sum_{j=2}^{j=2} AR_{ij} \right)^2 / 239;
\]

\[
CAAR_{t-2,t+2} = \frac{1}{N} \sum_{j=1}^{N} \left( \sum_{i=2}^{t+2} AR_{ij} \right); \quad \text{and } i, j \text{ are firm indices.}
\]

<table>
<thead>
<tr>
<th>Portfolio-Level Abnormal Returns</th>
<th>1.25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>p-value (time-series)</td>
<td>(0.042)</td>
</tr>
<tr>
<td>p-value (calendar-time)</td>
<td>(0.029)</td>
</tr>
</tbody>
</table>
Table 4. Relation Between Future Performance and Abnormal Returns around the MAKE Announcement

Panel A reports descriptive statistics for the future performance of MAKE winning firms over the year following the quarter in which the MAKE is awarded.

Panel B reports results from estimating a model of FuturePerformance for firm i over future period f, regressed on firm-level cumulative abnormal return, CAR, during the five days surrounding the MAKE award announcement (-2,+2). Period f refers to the average of the future four quarters following the quarter in which the MAKE award is received. Where less than four quarters of data are available we use all available quarters. CAR is computed as follows:

\[
CAR_{it} = \frac{1}{N_f} \sum_{t=-2}^{+2} AR_t, \quad \text{where:} \quad AR_t = R_t - E(R_t); \quad t = (-2,-1,0,+1,+2); \quad R_t \text{ is the return of the sample firm } i \text{ on day } t; \quad \text{and } E(R_t) \text{ is the corresponding market return from CRSP on day } t.
\]

The expected performance variable, ExpectedPerformance, is expected ROA, ROE, and CFO for firm i over future period f, calculated as the I/B/E/S consensus analyst annual earnings per share forecast divided by four (because our dependent variable is average quarterly performance), scaled by total assets per share or by stockholders’ equity per share for expected ROA or expected ROE, respectively. Expected Cash Flows from Operations are the I/B/E/S consensus analyst forecast of annual cash flows from operations per share divided by four (because our dependent variable is average quarterly performance), scaled by total assets per share. Total assets and stockholders’ equity are measured during the quarter in which the MAKE award is announced or, in the case of missing data, the quarter with data immediately before the MAKE winning quarter. P-values are in parentheses. Regression residuals are clustered by firm and year to control for potential cross-sectional and time-series correlation.

\[
\text{Model 1: } FuturePerformance = \alpha + \beta CAR + \epsilon
\]

\[
\text{Model 2: } FuturePerformance = \alpha + \beta (CAR + \text{ExpectedPerformance}) + \epsilon
\]

<table>
<thead>
<tr>
<th>Panel A: Descriptive Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Future Return on Assets</td>
</tr>
<tr>
<td>Future Return on Equity</td>
</tr>
<tr>
<td>Future Cash Flows from Operations over Assets</td>
</tr>
<tr>
<td>Expected Return on Assets</td>
</tr>
<tr>
<td>Expected Return on Equity</td>
</tr>
<tr>
<td>Expected Cash Flows from Operations over Assets</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Regression of Future Performance on Abnormal Returns around the MAKE Award Announcement Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted Sign</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Intercept</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>CAR</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Expected Performance</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>R^2</td>
</tr>
</tbody>
</table>
Table 5. Future Performance Tests

This table reports the one-year ahead performance of MAKE winners compared to two matched sample: one based on industry only, and one based on industry and total asset percentile, both measured during the quarter the MAKE is awarded.

Panel A presents descriptive statistics for the variables included in the analysis for the 202 MAKE winner observations with data during quarter of MAKE win.

Panel B presents descriptive statistics for the 51,030 MAKE peer firms matched on industry only.

Panel C presents descriptive statistics for the 202 MAKE peer portfolios matched on industry and percentile of total assets.

Panel D reports the results of comparing the future performance of the MAKE winners with the MAKE peer firms matched on industry only. This analysis regresses ROA, ROE, and Cash Flows from Operations over Assets on a dummy variable indicating whether the observation is a MAKE winner, and control variables for future performance, total assets, and the book-to-market (BTM) ratio. P-values are in parentheses. Regression residuals are clustered by firm and year to control for potential cross-sectional and time-series correlation.

Panel E reports the results of comparing the future performance of the MAKE winners with the MAKE peer firms matched on industry and percentile of total assets. This analysis performs a univariate comparison of ROA, ROE, and Cash Flows from Operations over Assets across the two samples.

The past performance variable is calculated as the average of the four quarters proceeding the quarter in which a MAKE is awarded. Where less than four quarters of data are available we use all available quarters. See previous tables for variable definitions. P-values are in parentheses.

<table>
<thead>
<tr>
<th>Panel A: MAKE winners (N = 202)</th>
<th>Mean</th>
<th>Median</th>
<th>Std Dev</th>
<th>25th Percentile</th>
<th>75th Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Future Return on Assets</td>
<td>0.029</td>
<td>0.025</td>
<td>0.024</td>
<td>0.011</td>
<td>0.044</td>
</tr>
<tr>
<td>Future Return on Equity</td>
<td>0.062</td>
<td>0.056</td>
<td>0.046</td>
<td>0.034</td>
<td>0.086</td>
</tr>
<tr>
<td>Future Cash Flows from Operations over Assets</td>
<td>0.101</td>
<td>0.097</td>
<td>0.057</td>
<td>0.061</td>
<td>0.138</td>
</tr>
<tr>
<td>Past Return on Assets</td>
<td>0.029</td>
<td>0.022</td>
<td>0.023</td>
<td>0.011</td>
<td>0.043</td>
</tr>
<tr>
<td>Past Return on Equity</td>
<td>0.059</td>
<td>0.053</td>
<td>0.043</td>
<td>0.036</td>
<td>0.080</td>
</tr>
<tr>
<td>Past Cash Flows from Operations over Assets</td>
<td>0.102</td>
<td>0.099</td>
<td>0.056</td>
<td>0.060</td>
<td>0.138</td>
</tr>
<tr>
<td>Total Assets</td>
<td>113,442</td>
<td>48,516</td>
<td>239,654</td>
<td>14,746</td>
<td>98,008</td>
</tr>
<tr>
<td>Book-to-Market</td>
<td>0.311</td>
<td>0.244</td>
<td>0.199</td>
<td>0.143</td>
<td>0.479</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: MAKE Peer Firms Matched on Industry Only (N = 51,030 peer firms)</th>
<th>Mean</th>
<th>Median</th>
<th>Std Dev</th>
<th>25th Percentile</th>
<th>75th Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Future Return on Assets</td>
<td>−0.025</td>
<td>0.004</td>
<td>0.094</td>
<td>−0.028</td>
<td>0.018</td>
</tr>
<tr>
<td>Future Return on Equity</td>
<td>−0.100</td>
<td>0.011</td>
<td>0.424</td>
<td>−0.053</td>
<td>0.035</td>
</tr>
<tr>
<td>Future Cash Flows from Operations over Assets</td>
<td>−0.015</td>
<td>0.022</td>
<td>0.163</td>
<td>−0.032</td>
<td>0.065</td>
</tr>
<tr>
<td>Past Return on Assets</td>
<td>−0.024</td>
<td>0.003</td>
<td>0.091</td>
<td>−0.029</td>
<td>0.018</td>
</tr>
<tr>
<td>Past Return on Equity</td>
<td>−0.057</td>
<td>0.011</td>
<td>0.253</td>
<td>−0.052</td>
<td>0.035</td>
</tr>
<tr>
<td>Past Cash Flows from Operations over Assets</td>
<td>−0.013</td>
<td>0.021</td>
<td>0.149</td>
<td>−0.034</td>
<td>0.064</td>
</tr>
<tr>
<td>Total Assets</td>
<td>3776</td>
<td>145</td>
<td>40713</td>
<td>31</td>
<td>752</td>
</tr>
<tr>
<td>Book-to-Market</td>
<td>0.595</td>
<td>0.455</td>
<td>0.552</td>
<td>0.263</td>
<td>0.734</td>
</tr>
<tr>
<td>Panel C: MAKE Peer Firms Matched on Industry and Asset Percentile (N = 202 peer portfolios)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>Median</td>
<td>Std Dev</td>
<td>25th Percentile</td>
<td>75th Percentile</td>
<td></td>
</tr>
<tr>
<td>Future Return on Assets</td>
<td>0.015</td>
<td>0.014</td>
<td>0.011</td>
<td>0.008</td>
<td>0.020</td>
</tr>
<tr>
<td>Future Return on Equity</td>
<td>0.031</td>
<td>0.037</td>
<td>0.040</td>
<td>0.019</td>
<td>0.049</td>
</tr>
<tr>
<td>Future Cash Flows from Operations over Assets</td>
<td>0.065</td>
<td>0.062</td>
<td>0.027</td>
<td>0.049</td>
<td>0.077</td>
</tr>
<tr>
<td>Total Assets</td>
<td>95,152</td>
<td>39,363</td>
<td>173,375</td>
<td>13,489</td>
<td>129,801</td>
</tr>
<tr>
<td>Book-to-Market</td>
<td>0.816</td>
<td>0.443</td>
<td>2.061</td>
<td>0.352</td>
<td>0.578</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel D: Regression of Future Performance for MAKE winners (N = 202) and MAKE Peer Firms Matched on Industry Only (N = 51,030 peer firms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FuturePerformance_{u} = \alpha + \beta_1 Winner + \beta_2 PastPerformance_{u} + \beta_3 Assets_{u} + \beta_4 BTM + \epsilon_{u}</td>
</tr>
<tr>
<td>Dependent Variable</td>
</tr>
<tr>
<td>Intercept</td>
</tr>
<tr>
<td>Winner</td>
</tr>
<tr>
<td>Past Performance</td>
</tr>
<tr>
<td>Assets (in billions)</td>
</tr>
<tr>
<td>Book-to-Market</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>R²</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel E: Univariate Analysis of Future Performance MAKE Winners (N =202) Compared with MAKE Peer Firms Matched on Industry and Percentile of Total Assets (N = 202)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Future Performance Measure</td>
</tr>
<tr>
<td>Future Return on Assets</td>
</tr>
<tr>
<td>Future Return on Equity</td>
</tr>
<tr>
<td>Future Cash Flows from Operations over Assets</td>
</tr>
</tbody>
</table>
Table 6. Analyst Forecast Revisions Following MAKE award

Panel A reports the number of upward and downward I/B/E/S analyst revisions of annual EPS forecasts during month t+1, where month t is the month in which the MAKE is awarded.

Panel B reports the average of each firm’s proportion of revising analysts who revise their annual EPS forecast upward during month t+1. The p-values under the mean and median correspond to one-tailed t-tests and Wilcoxon Sign tests, respectively, in accordance with our prediction that the consensus forecast revisions are positive, that the mean number of upward revisions is higher than the mean number of downward revisions, and that the proportion of upward to total revisions exceeds 50%.

Panel C reports the relative change in magnitude of the mean consensus annual EPS forecast from month t−1 to month t+1. The p-values, in parentheses, correspond to a one-sample t-test and a Wilcoxon Sign test for the mean and median, respectively.

Panel D reports a comparison in the change of the mean consensus annual EPS forecast from month t−1 to month t+1 between MAKE winning firms and a control group of peer firms matched on same industry, year, quarter, and percentile of total assets.

<table>
<thead>
<tr>
<th>Panel A: The Magnitude of Analyst Forecast Revisions (N = 183)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consensus EPS Forecast_{t+1} - Consensus EPS Forecast_{t-1}</td>
</tr>
<tr>
<td>Consensus EPS Forecast_{t-1}</td>
</tr>
<tr>
<td>Mean analyst forecast revision during month following the MAKE award</td>
</tr>
<tr>
<td>month relative to the month prior to MAKE award month</td>
</tr>
<tr>
<td>P-value</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: The Direction of Analyst Forecast Revisions (N = 190)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure 1 = ( \frac{\text{Number of Upward Revisions}_{t+1}}{\text{Number of Awards}} )</td>
</tr>
<tr>
<td>Measure 2 = ( \frac{\text{Number of Downward Revisions}_{t+1}}{\text{Number of Awards}} )</td>
</tr>
<tr>
<td>Mean number of analysts per MAKE winner that revise upward (Measure 1)</td>
</tr>
<tr>
<td>Mean number of analysts per MAKE winner that revise downward (Measure 2)</td>
</tr>
<tr>
<td>P-value for difference in means</td>
</tr>
</tbody>
</table>
**Table 6. Continued**

**Panel C: The Proportion of Analyst Upward Forecast Revisions (N = 173)**

<table>
<thead>
<tr>
<th>Number of Upward Revisions $r_{+1}$</th>
<th>Total Number of Upward or Downward Revisions $r_{+1}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean proportion of upward revisions during month following the MAKE award month relative to the total upward or downward revisions</td>
<td>0.594</td>
</tr>
<tr>
<td>P-value</td>
<td>(0.002)</td>
</tr>
</tbody>
</table>

**Panel D: MAKE winners versus Control Sample Analysis of the Magnitude of Analyst Forecast Revisions Surrounding the Award Month**

<table>
<thead>
<tr>
<th>Revision Period</th>
<th>Test Sample (MAKE firms)</th>
<th>Control Sample (matched peer firms)</th>
<th>Difference between Test and Control Samples (Test – Control)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>P-value</td>
</tr>
<tr>
<td>Test Sample (MAKE firms)</td>
<td>(-3, -1)</td>
<td>151</td>
<td>-0.009</td>
</tr>
<tr>
<td></td>
<td>(-1, +1)</td>
<td>159</td>
<td>0.033</td>
</tr>
<tr>
<td></td>
<td>(+1, +3)</td>
<td>121</td>
<td>0.021</td>
</tr>
<tr>
<td>Control Sample (matched peer firms)</td>
<td>(-3, -1)</td>
<td>151</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(-1, +1)</td>
<td>159</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>(+1, +3)</td>
<td>121</td>
<td>0.002</td>
</tr>
<tr>
<td>Difference between Test and Control Samples (Test – Control)</td>
<td></td>
<td></td>
<td>P-value from two-sample t-test for comparison of means</td>
</tr>
<tr>
<td></td>
<td>(-3, -1)</td>
<td>151</td>
<td>-0.009</td>
</tr>
<tr>
<td></td>
<td>(-1, +1)</td>
<td>159</td>
<td>0.033</td>
</tr>
<tr>
<td></td>
<td>(+1, +3)</td>
<td>121</td>
<td>0.020</td>
</tr>
</tbody>
</table>
Table 7. Future Abnormal Returns for Portfolios Constructed on MAKE Winners

This table reports results from estimating future abnormal returns for portfolios constructed on MAKE winners during 2001-2008. Portfolios are constructed on July 1\textsuperscript{st} of each year, and include all MAKE winners during the preceding 12 months. Monthly return data are obtained from CRSP, and portfolio monthly returns are calculated each month as the equally-weighted monthly returns for all firms in the portfolio. Portfolios are rebalanced every year, and portfolio monthly returns in excess of the monthly risk-free rate, \((Ret - R_{f,pm})\), are regressed on the four Fama-French and Momentum factors: Excess Return on the Market (MKT), Small-Minus-Big Return (SMB), High-Minus-Low Return (HML), and Momentum (MOM). The monthly risk-free rate is the return on the one month Treasury Bill.

\[
(Ret - R_{f,pm}) = \alpha_p + \beta_1MKT + \beta_2SMB + \beta_3HML + \beta_4MOM + \varepsilon_{pm}
\]

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.009</td>
<td>2.870</td>
<td>0.005</td>
</tr>
<tr>
<td>MKT</td>
<td>1.292</td>
<td>14.870</td>
<td>(&lt;0.001)</td>
</tr>
<tr>
<td>SMB</td>
<td>0.012</td>
<td>0.100</td>
<td>0.922</td>
</tr>
<tr>
<td>HML</td>
<td>-0.663</td>
<td>-4.820</td>
<td>(&lt;0.001)</td>
</tr>
<tr>
<td>MOM</td>
<td>0.007</td>
<td>0.090</td>
<td>0.926</td>
</tr>
</tbody>
</table>

No. of months with returns 90

Adj R-Sq 0.813
Figure 1. Timeline for Test of Future Risk-Adjusted Returns for Portfolios Constructed on MAKE Winners

The figure plots the timeline for the analysis of one-year ahead abnormal returns for portfolios constructed on MAKE winners. The first portfolio, constructed on July 1, 2001, includes all firms that receive a MAKE award during the prior 6 months. Portfolios are reconstructed on July 1 of each year \( t \) based on KM award winners during the prior 12 months. Our sample includes the monthly observations from July 2001 through December 2008 \( (N = 90) \). Each firm’s monthly returns are obtained from the CRSP Monthly Stock File, and the monthly portfolio returns are obtained by averaging all firms’ returns in each month during the test period. The monthly portfolio returns are regressed on the four Fama-French and Momentum factors: excess return on the market (MKT), Small-Minus-Big Return (SMB), High-Minus-Low Return (HML), and Momentum Factor (MOM).
APPENDIX A

This appendix provides a summary explanation of each of the eight criteria used by the expert panelists to determine the MAKE winners, extracted and paraphrased from Asian Productivity Organization (2007). These are the activities and characteristics that the MAKE award organizers expect to distinguish companies that are successful at KM.

1. Creating a Knowledge-Driven Enterprise Culture

A logical first question in evaluating knowledge management is to ask: Do we have the type of organizational culture that rewards knowledge-driven activities? Many organizations are very old and were created in an industrialized age. Newer companies like Google, Yahoo and Microsoft were formed in different times with different characteristics. Issues to consider with respect to culture include: How does an organization hire people? What are the attributes one is looking for? What are the behaviors, attitudes and skills? Does the organization have a knowledge sharing, collaborative environment already in place? How innovative is the organization? Does the organization listen to customers? Does the organization reward people for sharing knowledge?

2. Developing Knowledge Workers through Senior Management Leadership

Companies that are successful at managing knowledge tend to have senior management teams that are devoted to knowledge-driven activities. Many organizations have created a post called the “Chief Knowledge Officer,” or “Chief Information Officer,” which acts as a focal point and a way by which organizations can vividly demonstrate that knowledge is a critical activity within the business.

3. Delivering Knowledge-Based Products/Services/Solutions

The third area refers to innovation, which takes many forms. It may simply be new product development that is taking current products, ideas or solutions and changing them slightly. Alternatively, an organization could devote major resources to the development of new innovative products. It is not necessarily just innovation regarding products and services. Firms may also be innovative internally, such as creating innovative processes for logistics. For example, Dell is a company that is very innovative in its ability to use the Internet and logistics services to build computers for customers on demand.

4. Maximizing Enterprise Intellectual Capital

The fourth area is maximizing enterprise intellectual capital. Intellectual capital can be the value of an organization’s brand or brands. It can also be patents, copyrights, trademarks, proprietary processes or those core abilities of an organization which separate it from its competitors or from other organizations. A challenge for companies in this area is identifying what intellectual capital they have. Companies that are able to manage their intellectual capital are expected to be successful in the future.
5. Creating an Environment for Collaborative Knowledge Sharing

The fifth area is creating a collaborative environment. Many companies spend considerable resources to create IT platforms and ways to transform tacit knowledge into explicit knowledge. These include tools such as “After Action Reviews” (used by Buckman Laboratories) which are mechanisms for learning and sharing best practices. In the early days of KM, this was an area where many companies worked very hard to differentiate themselves. Today, it is almost a given that if an organization is not able to collaborate, share and re-use knowledge effectively it will not be able to compete in its marketplace.

6. Creating a Learning Organization

Organizational learning is a key characteristic of leading knowledge-driven organizations. Organizational learning includes corporate memory, which is the accumulated knowledge of how companies do business. It also includes the ability to give employees skills and competencies that allow them to be innovative, to be creative and to deal with customers intelligently. The objective is to avoid following a traditional learning curve when faced with a new problem or opportunity. Instead, learning organizations have a workforce that is trained to deal with the next problem and able to create the next new product.

7. Creating Value based on Customer Knowledge

The seventh area is creating value based on customer knowledge. This is more than just customer satisfaction and customer information. This is an ability to create relationships with customers, where Toyota Motor Corporation or Sony are examples of success in this area. It is being able to understand how customers use a product, what their needs are and what their expectations are. Creating value based on customer knowledge is the ability to understand the customers’ needs and to create a revenue stream from a customer or customers.

8. Transforming Enterprise Knowledge into Organizational Wealth

While the first seven criteria above are the input criteria, the eighth area is essentially output. It is the overall ability of the organization to transform the knowledge and capabilities of its people and processes into either shareholder wealth or some similar form of wealth creation. Many organizations are good at several of the seven characteristics I have named. They might be good at marketing, they might be good at product development or they might be a learning organization. But it is extremely difficult to integrate all seven of those such that the output of an organization’s abilities is maximized.
APPENDIX B

Siemens ShareNet

In the late 1990’s Siemens began implementing knowledge management as a means of responding to increasing competition and deregulation.17 Siemens had recognized that so-called “knowledge islands” had developed within their organization based on organizational and hierarchical barriers; business, process, project and functional barriers; and local time, culture and language barriers. As a result, Siemens had “poor reuse” of solutions generated for customers and there was “limited” best practice sharing in sales. In order to mitigate these limitations, Siemens took the approach of generating support for “knowledge communities” that cut across and integrated those many knowledge islands. In addition, they set out to capture and disseminate their best practices across Siemens world-wide organization.

The core idea was that knowledge management initially would focus on sales and marketing. Siemens saw that countries in similar stages of economic development and regulatory environments would have similar needs. They also noted that as markets developed, solutions could be leveraged from more economically developed countries to developing countries. As a result, they developed a system that allowed users to enter best practices in the form of “solutions objects” and “environmental objects.” In addition, the system permitted “urgent requests” that allowed sales people to ask other sales people if they had a solution for a specific problem.

The resulting system allowed Siemens to address questions such as “What sales deals have we lost or won recently?” “Why and how did we win them?” and “Who in Siemens is the

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expert on a specific topic?” Ultimately, in the fiscal year 2000-2001, the system resulted in an incremental $122 million in revenue at a system cost of $7.8 million.

**British Petroleum**

Sir John Browne, CEO of British Petroleum (BP), in acknowledging the success of BP’s KM initiatives that were implemented in the mid-1990’s, stated "In order to generate extraordinary value for shareholders, a company has to learn better than its competitors and apply that knowledge throughout its businesses faster and more widely than they do. The way we see it, anyone in the organization who is not directly accountable for making a profit should be involved in creating and distributing knowledge that the company can use to make a profit." (Prokesch, 1997)

In 1992, BP was top heavy with bureaucracy and facing bankruptcy (Roberts 2005). In response, BP decentralized and downsized, which resulted in what the company refers to as “lost knowledge” (Milton and Palen, 2000). In an attempt to leverage the remaining knowledge in their organization, BP instituted a KM initiative that set up a number of technical, functional and commercial networks, as well as a series of informal networks based on employee interests. These networks encompassed a number of technological and organizational approaches designed to facilitate employee learning from others within the company, cooperation, and learning from those outside the company (Berzins et al., 1998). For example, there were formal operations management networks that were designed to accelerate or increase production, and train and deploy new operators. Networks also were used to capture informal “communities of interest” across different units with virtual meetings. According to BP, this change in organization design reportedly resulted in a bottom line increase of $260 million in a single year (Stewart, 1999).
By 2000 BP had more than 50 formal networks and roughly 300 informal networks with the explicit goal of generating and capturing knowledge (Milton and Palen, 2000). BP’s KM initiative also included the institution of an intranet system to facilitate sharing data, information and knowledge. Search engines were used to facilitate access to the substantial digital resources that were generated, and a “who is who” feature, called “connect” was developed so that employees could easily access others in the organization with the knowledge needed for a given application. Among other things, the contact pages included the employees area of expertise, and at one point in time, more than 12,000 employees were in the “connect” network (Stewart, 1999).

A particularly successful feature of BP’s efforts to “learn from others within the company” was accomplished by what were termed “peer assists.” Peer assists consisted of members of the staff in one business unit helping those in another business unit. Peer groups were formed that consisted of confederations of business units that faced similar problems, who benchmarked each other. For example, a Dutch refinery got a “peer assist” two-day meeting that ended up resulting in knowledge acquisition that saved the refinery $9 million. Cooperation from business units, exemplified by peer assists is grounded in the spirit of commitment to long-term improvement. Each business unit benchmarks itself against key best practices using an assessment tool. Good practices are shared and tools and requests are made available through an intranet community of interest network.