Association for Information Systems
AIS Electronic Library (AISeL)

ECIS 2012 Proceedings

European Conference on Information Systems (ECIS)

5-7-2012

EXPLORING THE RELATION BETWEEN FIRM OWNERSHIP AND IT CAPABILITY

André Schäfferling
German Graduate School

Heinz-Theo Wagner
German Graduate School

Jochen Becker
German Graduate School

EXPLORING THE RELATION BETWEEN FIRM OWNERSHIP AND IT CAPABILITY

Schäfferling, André, German Graduate School, Bildungscampus 2, 74076 Heilbronn, Germany, andre.schaefferling@ggs.de

Wagner, Heinz-Theo, German Graduate School, Bildungscampus 2, 74076 Heilbronn, Germany, heinz-theo.wagner@ggs.de

Becker, Jochen, German Graduate School, Bildungscampus 2, 74076 Heilbronn, Germany, jochen.becker@ggs.de

Abstract

As IT spending continuously increased throughout the last years, it nowadays accounts for a significant amount of total corporate spending. Simultaneously, academic research validated the strategic importance and performance benefits derived from a superior IT capability – the ability to successfully deploy organizational IT skills and resources. Furthermore, shareholders pursuing long-term oriented goals are interested in consistent investments to develop organizational capabilities, such as IT capability. Consequentially, the question arises how a firm's ownership structure is related to its IT capability.

This research question is addressed by analyzing secondary data on publicly listed U.S. companies of the last ten years. The results provide support for the hypothesized relation throughout the investigated period and withstand several control and robustness tests.

This study contributes to the ongoing research on IT capability by showing that certain types of shareholders promote the development and deployment of IT capability which in turn influences strategic topics. Findings further confirm that decisions on IT investments characterized by long-term benefits must be backed by owners with a corresponding long-term investment horizon.

Keywords: IT Capability, Shareholder, Institutional Investors, Ownership Turnover.

1 Introduction

In 2004 global IT spending exceeded 2 trillion dollars (Asif and Schuff, 2005). At the level of a single publicly traded firm IT spending typically accounts for hundreds of millions and for large multinational companies even for billions of dollars (Ray et al., 2009). Thus, "like R&D, IT spending represents an important expenditure to be decided by corporate managers" (Ravichandran et al., 2009, p. 207) and often is aimed at developing an IT capability that supports strategic objectives (Ross et al., 1996). In this context, IT capability refers to the ability of firms to deploy IT together with complementary assets (Bharadwaj, 2000).

Regarding the support of strategic objectives by IT, a vast amount of literature centers IT as a strategic resource deployed to achieve competitive advantage. Superior IT capability was found to positively affect various firm performance measures (Bharadwaj, 2000; Santhanam and Hartono, 2003), contribute to competitive advantage (e.g. Bhatt and Grover, 2005; Dehning and Stratopoulos, 2003), exert influence on performance effects of diversification (Ravichandran et al., 2009), and shape competitive action (Chi et al., 2010).

However, prior research demonstrates that (1) the link between IT and some payoff is indirect, complex, and influenced by contingency factors (Lee et al., 2001), (2) time lags between investment in IT and its potential outcomes prevail (Brynjolfsson and Hitt, 2003), making IT investments long-term investments, (3) IT creates intangible impacts (Tallon et al., 2000), and (4) generating business value depends on the ability of firms to combine IT resources and complementary organizational resources (Melville et al., 2004). Thus, IT investments need a long-term horizon and comprehension of intangible effects.

Finance literature also focuses on strategic topics such as the influence of specific stakeholder groups in the context of long-term investments or the role of intangibles within these investment decisions. For example, the role of disclosing intangible information, i.e. information not presented in balance sheets like Research and Development (R&D) expenses, and its effect on equity investment decisions is discussed (Daniel and Titman, 2006; Jiang, 2010). Additionally, the relationship between investment horizon of decision-makers and investment decisions (Lin and Lee, 2004; Loibl and Hira, 2009), and the relationship between ownership structure and long-term goals or success of M&A negotiations (Bushee, 1998; Gaspar et al., 2005) is a subject in finance literature.

In particular, research on a firm's ownership structure in terms of the owners' equity stakes and identity, e.g. families or institutional investors, generates strong interest (Munari et al., 2010). Studies manifest among others the influence of certain shareholder groups on decisions made in respect to innovation (Bushee, 1998; Kochhar and David, 1996), performance (Cornett et al., 2008; Oswald and Jahera Jr, 1991; Thomsen and Pedersen, 2000), and strategy (Tihanyi et al., 2003; Wright et al., 2002).

However, we could not identify studies that examined effects related to strategic IT issues, neither in general nor in specific. IT capability for example was shown to render strategic effects and thus should be of interest to owners as well. Therefore, this study is guided by the following research question:

> How is a firm's ownership structure related to its IT capability?

To address this research question, we develop a research model by arguing that shareholders' investment horizon affects the allocation of resources and the development of capabilities, in particular a firm's IT capability. Empirically, we scrutinize a ten year time period and use secondary data on IT capability published by InformationWeek (compare Bharadwaj, 2000; Santhanam and Hartono, 2003) in combination with ownership data (compare Gaspar et al., 2005) from Thomson Reuters.

Linking previously unconnected reasoning of firm ownership from finance literature with the field of IT capability, we contribute to both, our understanding of finance research as well as to the IS literature. Further, we demonstrate that specific types of owners promote the development and

deployment of a firm's IT capability. Thus an important, previously not considered, enabler of IT capability is revealed. Further research areas are outlined and managerial recommendations derived.

The paper is structured as follows. First of all, the concepts of IT capability and firm ownership are briefly introduced. The subsequent section presents the research model linking these two concepts. Hereinafter, the methodology section describes the data as well as the applied method, followed by the results of our analysis. The paper concludes with a discussion of the results. Finally, contribution, limitations, and further research complete the last section.

2 Theoretical Background

2.1 IT Capability

Research on IT capability is a growing field of IS research and an integral part in the debate regarding the business value of IT (Kohli and Grover, 2008). Early studies conceptualized IT capability rather unilateral, either focusing on technological capabilities (Sabherwal and Kirs, 1994) or on managerial capabilities (Sambamurthy and Zmud, 1997). Based on previous studies, Bharadwaj et al. (1999, p. 381) integrated six different dimensions to form a more comprehensive concept and highlighted IT capability as the "ability to sustain IT innovation and respond to changing market conditions through focused IT applications". Similiarly, Galbraith (1974) described IT capability as ability of information systems to improve information processing capabilities to handle and respond to environmental uncertainty resulting from technological change, increased competition, or diversification.

In her seminal article, Bharadwaj (2000, p. 171) defined IT capability as the "ability to mobilize and deploy IT-based resources in combination or copresent with other resources and capabilities" and provided evidence, that superior IT capability results in higher firm performance. Santhanam and Hartono (2003) extended this work by comparing firms with superior IT capability not only to a single benchmark firm, but also to all firms in the same industry and found similar results.

The strategic advantage through IT capability has been theorized (Bharadwaj et al., 1999) and empirically validated e.g. regarding sustained competitive advantage (Dehning and Stratopoulos, 2003). The strategic value and influence of IT and related capabilities on firm value and performance has further been emphasized in contemporary research. Chi et al. (2010) showed that market opportunities can be exploited by using IT-enabled capabilities whereas Ravichandran et al. (2009) investigated the influence of IT capability on performance effects of diversification. Ray et al. (2009) showed that IT is related to vertical integration with variations depend on demand uncertainty and industry concentration. Joshi et al. (2010) relate IT-enabled knowledge capabilities and innovation outcomes and find that IT usage promotes knowledge capabilities and in turn innovation.

Thus, the literature on IT capability provides extensive evidence that firms with superior IT capability benefit from superior performance as well as from strategic and competitive advantages.

2.2 Firm Ownership

In the following, we use the terms investor and owner interchangeably. Until the 1980s, investors typically represented private owners, whereas in subsequent years the amount of institutional investors[1] increased constantly. Public pension funds constituted the first type of institutional investors

[1] According to the SEC rule 13F institutions that manage more than $100 million in equity are required to report their equity holdings that exceed $200.000 in market value or 10.000 shares. Those institutional investors encompass insurance companies, banks, mutual funds, and pension funds that invest on behalf of others. Entities, such as arbitrageurs or brokerage firms, holding stock for own interest are not obliged to report by Rule 13F (Bushee 1998, Wines 1990).

and started to submit "shareholder proposals, pressured management 'behind-the-scenes' for corporate reforms, and used the press to target the management and boards of poorly governed or performing companies" (Gillan and Starks, 2007, p. 55). Thus this type of investor tried to actively monitor and influence companies to maximize their returns from shares. From then on, this so called investor activism is typical for institutional investors whose structure changed over the years from nearly exclusively public pension funds to a majority consisting of hedge funds and private equity funds which "have become increasingly important players in financial markets, particularly in their capacity as monitors of corporate performance and agents of change" (Gillan and Starks, 2007, p. 55). Nowadays, institutional investors play a prevalent role in financial markets. In 2006, their equity holdings accounted for over 70% compared to 10% in 1953 (Gillan and Starks, 2007).

Thus, today investor behavior covers a broad range of actions. There are investors who simply trade, i.e. buy, hold, and sell shares, and thereby express their assessment of a firm's performance. On the other hand, there are active investors that closely monitor and influence companies and their decision making process, e.g. by initiating takeovers, management buy-outs, and corporate changes (Gillan and Starks, 2007). To investigate the behavior of institutional investors, they have been classified by type, e.g. banks, investment advisors, or public pension funds (Lang and McNichols, 1997), investment horizon such as short and long-term (Gaspar et al., 2005), or investor behavior (Bushee, 1998). Bushee (1998) distinguishes three types of owners: (1) "transient institutional owners, who hold small stakes in numerous firms and trade frequently in and out of stocks, generally basing their trades on a value proxy such as current earnings", (2) dedicated owners with "large, long-term holdings, which are concentrated in only a few firms", and (3) quasi-indexer who "use indexing or buy-and hold strategies that are characterized by high diversification and low portfolio turnover" (Bushee, 1998, p. 310f.).

3 Research Model

The assessment of IT's economic impact has been demonstrated to be crucial to IS research (Santhanam and Hartono, 2003). As mentioned above, several studies on IT capability, including especially recent ones, show the effect of IT capability not only on superior performance, but also on strategic issues such as diversification. Those studies also emphasized that investments in IT typically are long-term investments such that effects of these investments can be achieved not immediately but with some lag effect (Santhanam and Hartono, 2003). Furthermore, it is necessary for firms to be able to leverage those investments to create unique capabilities that are developed over time (Ravichandran and Lertwongsatien, 2002) and involve "organizational learning: learning how to combine and use resources" (Andreu and Ciborra, 1996, p. 113). A firm's IT capability is the basis to achieve advantages from IT investments (Duliba et al., 2001). Thus, "(s)trategic advantage results to organizations that can exploit IT functionality on a continuous basis" (Bharadwaj et al., 1999, p. 383). "Given the long lead times and costs entailed in the development and deployment of IT capabilities" (Tanriverdi et al., 2010, p. 833) continuous investments in IT over time are necessary.

Deciding on continuous investments with long-term effects requires managers who are willing to spend money on projects with future prospects (and also risks) instead of focusing on short-term goals, like increasing cash-flow by avoiding investments or cutting IT costs. The effect of this so called myopic behavior of management is an underinvestment in long-term projects in order to meet short-term goals (Bushee, 1998) that has been analyzed in the finance literature. Studies show that myopic behavior is related to the investment horizons of shareholders. Institutional investors exhibiting high portfolio turnover have short-term investment horizons (Gaspar et al., 2005) and have been demonstrated to be positively associated with myopic investment behavior (Bushee, 1998). In particular, "pressures for myopic investment behavior are created by "transient" institutional owners, who hold small stakes in numerous firms and trade frequently in and out of stocks, generally basing their trades on a value proxy such as current earnings" while dedicated owners "alleviate pressures for myopic investment behavior because their large, long-term holdings, which are concentrated in only a few firms, provide incentives to monitor managers and to rely on information other than earnings to

assess the managers‘ performance” (Bushee, 1998, p.310). Thus, institutional investors who exhibit long-term investment horizons “remove incentives for myopic investment behavior by providing a higher degree of monitoring of managerial behavior” (Bushee, 1998, p. 309) and have “a higher ability to hold out” (Gaspar et al., 2005, p. 162).

Therefore institutional investors, dependent on their investment horizon, influence corporate decisions towards investing in IT. Managers following a long-term strategy regarding IT are forced to continuously gather capital to be able to develop and deploy the IT capability over time. Investors exhibiting long-term investment horizons by definition are inclined to dedicate capital rendering effects in the long-term and thus supporting development and deployment of a firm’s IT capability. Moreover, as mentioned above, investors with long-term investment horizons reduce incentives for myopic behavior and support decisions towards investments with effects in the long-term.

Therefore we hypothesize that firms exhibiting an ownership structure with low turnover, i.e. owners with long-term investment horizon, will exhibit a superior IT capability.

Figure 1. Research Model.

4 Methodology

4.1 Data

To explore the relation between firm ownership and IT capability we concentrate on firms listed at the American stock market. These companies are controlled by the U.S. Securities and Exchange Commission (SEC) and therefore have to follow strict rules and high standards of disclosure. In particular this fact ensures a certain level of quality and thus a comprehensive base of corporate data.

Following previous research on IT capability (e.g. Bharadwaj, 2000), we adopt the InformationWeek 500 ranking to determine the group with superior IT capability. InformationWeek’s annual ranking of the biggest and best corporate users of information technology exhibit the best performers every year. InformationWeek (IW) applies several criteria to come up with the ranking and changed the procedure in the past from time to time. We have chosen the timeframe from 1997 to 2009, because of the stability of ranking criteria during that period and the availability of ownership data (available since 1997).

The description of the ranking criteria used by IW shows that the ranking is combined out of several measures covering technical parameters such as the degree of computerization e.g. measured by hardware endowment as well as parameters regarding the use of IT. Thus, the ranking provides a more complete picture about the IT landscape of a company than pure investment measures and incorporates also intermediate effects of IT, namely the use process. In particular, the latter is central in the argumentation of Soh and Markus (1995) discussing the transformation of IT investment to performance effects. The ranking therefore taps into central elements of a firm’s IT capability as discussed in the previous section and can serve as an (although incomplete) proxy for IT capability.

The total amount of individual firms ranked by IW at least once between 1997 and 2009 reached almost 2000 individual firms throughout the years. Of those, 1596 could also be identified in the Thomson database. Most of the residual companies not covered by Thomson are private companies.

After eliminating some more companies from our sample due to the lack of publicly available financial data for those companies, the final sample size encompasses 1522 individual companies.

To structure the sample, we follow the approach as employed by Santhanam and Hartono (2003) who divided the sample into firms with superior IT capability and a control sample based on two-level- and four-level SIC codes. Following Bharadwaj (2000), we defined superior IT capability as referring to an enduring capability that can be assumed if companies have been ranked at least twice by InformationWeek within a five year time window.

All other firms of the same industry, defined by 2-level or 4-level- SIC code, form the corresponding control sample. Companies of the control sample have been retrieved by using a combination of two listings: the Dow Jones Wilshire 5000 index and the Russell 3000 index. Both indices together encompass exclusively U.S. based, publicly traded companies and represent more than 98% of U.S. market capitalization. However, extremely small companies and penny stocks are excluded. The complete size of our control sample encompasses a total of 4637 U.S. companies. In a next step, the companies ranked by InformationWeek were excluded from this control group to avoid bias by comparing ranked firms with each other and so affecting the control values. This procedure resulted in a final size of 3935 companies in the control sample.

The ownership data has been retrieved from Thomson Reuters, one of the world's largest information companies. The data accessible date back to 1997 and thus offers a unique possibility to explore the proposed relation within a 13 year time window. This allows avoiding bias involved with primary measures and provides standardized data comparable across firms.

4.2 Ownership Measure

Ownership structure has been measured in different ways during the last years. We adopt the operationalization proposed by Gaspar et al. (2005). They calculate the ownership turnover at the firm level to determine the short- or long-term orientation of its investors. Gaspar et al. (2005) relate the accumulated value of portfolio changes to the total portfolio value to see the rate "of how frequently [an investor] rotates his positions on all the stocks of his portfolio (churn rate)" (p. 142). Following this logic, we calculate the ownership turnover for all available institutional investors by the end of each quarter since 1998. Although the available data dates back to 1997, it is not possible to calculate all the values for the first year because the previous quarter is always required to determine the portfolio change. Thus, 1998 is the first year to be calculated. In the next step, for all companies the average weighted turnover rate of all its individual investors is determined to provide the average holding time and thus the ownership orientation and structure for each firm in the two samples. We calculate both, firm turnover in the last quarter of a year (Q4) as well as the average firm turnover per year. Q4 was chosen because it is the last quarter prior to the collection of the IW ranking data.

4.3 Control Measure

Previous finance research shows that ownership structure is related to innovative activities of firms generating prospects for the future. Therefore, for industries represented by the SIC codes exhibiting R&D (such as manufacturing) we control for the innovation capability of a firm, which is operationalized in terms of R&D intensity, the ratio of R&D expenditure to sales. This control measure has been widely adopted in academic research (e.g. Kimbrough, 2007). For industries such as banking not exhibiting R&D our control measure does not apply.

Companies with extreme values regarding R&D intensity are eliminated from the sample due to distorting effects on results. To eliminate extreme values, a two step procedure is applied. In the first step, we eliminate for each quarter values of R&D intensity greater than 100%, i.e. R&D expenditure exceeds sales. Those extreme values for example are possible for companies acting in emerging markets such as biotechnology or when companies face bankruptcy and sales decline dramatically.

Secondly, the resulting sample is further limited to those companies that have at maximum the triple R&D intensity than the industry average.

For example, in 2008 our sample encompasses 3293 companies exhibiting R&D. We eliminated 1.057 values listed with Zero, 247 companies exceeding the 100% threshold and 66 companies exceeding the average R&D intensity of their industry more than three times. This finally resulted in 1923 companies with reasonable R&D values for 2008.

4.4 Method

Following previous research on IT capability by Santhanam and Hartono (2003), the companies ranked by InformationWeek constitute the sample of firms with superior IT capability and are compared within their industry based on their 4-level and 2-level Standard Industrial Classification (SIC) code. We therefore combine the ownership turnover values for each company classified as having a superior IT capability with the average industry turnover values from the control sample.

Comparing the sample with their respective industry provides a more robust test than a comparison with a single benchmark firm. Furthermore, the use of 4-level and 2-level SIC codes also supports robustness of results, because a 2-level SIC code exhibits a larger and more heterogeneous group of companies than a 4-level SIC code and thus provides a stronger control sample (Santhanam and Hartono, 2003).

To analyze the previously constructed matched pairs, we apply the Wilcoxon Rank Sum Test for each year in analogy to Bharadwaj (2000) and Santhanam and Hartono (2003).

Following contemporary research (Brynjolfsson and Hitt, 1998; Santhanam and Hartono, 2003) investments in and development of an IT capability have a lagged effect on performance. We expect that companies can reap the benefits of superior IT capability in the subsequent period. Because we test for several lag effects, the years of analysis are limited from 2000 to 2009.

5 Results

As stated above, we combine the firm turnover data for the years t_{-1} to t_{-3} with the ranking data of year t, to test their relation with various lag effects. E.g., we test the relation between ranking data of year 2009 with turnover data of the preceding years 2006 (t_{-3}) to 2008 (t_{-1}). In particular, we analyze the IW rankings from 2009 to 2000 and accordingly turnover data from 2008 to 1998.

Table 1 displays the results from the analysis of the annual average ownership turnover values for the years 2009 to 2003 (IW ranking). Due to space limitations, the results for the years 2002 to 2000 are not displayed. However, the results are identical to those from more recent years. Additional tests solely comparing the turnover values from the fourth quarter, which is the last quarter before the IW evaluation period for the next year starts, yielded similar results. As mentioned before, the sample size of ranked companies was further limited to those companies that were ranked at least twice (superior IT capability) within the selected year and the four years preceding the selected year to gain more robust result (Bharadwaj, 2000). Nevertheless, we tested the complete sample as well without this restriction and still received significant results.

Overall, the analysis shows consistent results for all periods. Firms with superior IT capability are characterized by significantly lower firm turnover values and thus long-term investors in preceding years. The medians show that these differences almost always increase when compared at the 2-level instead of the 4-level SIC code. However, the results consistently provide strong support for the hypothesized relation between ownership structure in terms of firm turnover and IT capability. Long-term investors seem to be an important enabler of superior IT capability.

		IT capability 2009			
		N	**Mean**	**Median**	**Z-Value**
Turnover 2008, avg.	leader control	203 224/237	0.268 0.307/0.312	0.256 0.314/0.317	-7.825**/-9.639**
Turnover 2007, avg.	leader control	205 223/237	0.297 0.353/0.361	0.284 0.360/0.368	-9.296**/-10.146**
Turnover 2006, avg.	leader control	202 223/237	0.254 0.312/0.315	0.238 0.313/0.323	-8.481**/-9.618**
		IT capability 2008			
		N	**Mean**	**Median**	**Z-Value**
Turnover 2007, avg.	leader control	226 256/274	0.292 0.353/0.361	0.281 0.360/0.366	-9.879**/-11,143**
Turnover 2006, avg.	leader control	222 256/274	0.251 0.312/0.314	0.237 0.313/0.314	-9.511**/-10.506**
Turnover 2005, avg.	leader control	221 256/274	0.238 0.301/0.305	0.225 0.305/0.308	-9.372**/-10.696**
		IT capability 2007			
		N	**Mean**	**Median**	**Z-Value**
Turnover 2006, avg.	leader control	222 263/280	0.248 0.306/0.310	0.237 0.308/0.302	-9.345**/-10.475**
Turnover 2005, avg.	leader control	222 262/280	0.233 0.296/0.300	0.223 0.300/0.299	-9.505**/-10.844**
Turnover 2004, avg.	leader control	220 261/280	0.232 0.300/0.301	0.219 0.299/0.305	-9.313**/-11.050**
		IT capability 2006			
		N	**Mean**	**Median**	**Z-Value**
Turnover 2005, avg.	leader control	217 253/278	0.230 0.301/0.302	0.219 0.304/0.307	-10.028**/-11.029**
Turnover 2004, avg.	leader control	216 252/278	0.232 0.303/0.301	0.218 0.302/0.305	-9.397**/-11.029**
Turnover 2003, avg.	leader control	215 247/278	0.235 0.280/0.282	0.224 0.278/0.283	-7.123**/-9.773**
		IT capability 2005			
		N	**Mean**	**Median**	**Z-Value**
Turnover 2004, avg.	leader control	181 213/234	0.231 0.306/0.303	0.219 0.302/0.305	-9.507**/-10.591**
Turnover 2003, avg.	leader control	180 208/234	0.235 0.280/0.283	0.225 0.275/0.283	-7.740**/-9.732**
Turnover 2002, avg.	leader control	179 208/234	0.246 0.273/0.271	0.224 0.267/0.268	-5.815**/-7.353**
		IT capability 2004			
		N	**Mean**	**Median**	**Z-Value**
Turnover 2003, avg.	leader control	224 258/295	0.235 0.277/0.281	0.226 0.274/0.283	-7.265**/-10.460**
Turnover 2002, avg.	leader control	223 260/295	0.242 0.268/0.269	0.227 0.265/0.264	-5.369**/-8.086**
Turnover 2001, avg.	leader control	221 254/295	0.259 0.275/0.281	0.248 0.280/0.282	-4.104**/-6.428**
		IT capability 2003			
		N	**Mean**	**Median**	**Z-Value**
Turnover 2002, avg.	leader control	242 276/318	0.243 0.261/0.268	0.231 0.256/264	-4.232**/-7,425**
Turnover 2001, avg.	leader control	240 271/318	0.259 0.272/0.280	0.250 0.273/0.282	-3.199**/-6.236**
Turnover 2000, avg.	leader control	234 273/318	0.270 0.299/0.309	0.261 0.294/0.309	-5.514**/-9.317**

*Table 1. Results for Matched Sample Comparison at the four/two-digit SIC Code Caption: ** for significance at the 0.01 level*

Controlling for R&D intensity in R&D-active industries consistently shows that our sample containing firms with superior IT capability is significantly different from the control sample with regard to R&D intensity. Our sample (regarding R&D-active industries) exhibits significantly lower R&D intensity by simultaneously exhibiting low turnover when compared to the control sample. These findings are surprising for us as we expected that low R&D intensity is related to high turnover (i.e. short-term oriented investors) as demonstrated by some studies from accounting literature.

Prior accounting literature distinguishes between the impact of short-term oriented investors on a firm's level of intangible investments such as R&D and their ability to monitor the value created by these investments. Supporting Bushee's (1998) findings on the relationship between high levels of transient investors (i.e. short-term oriented) and low R&D spending (Dikolli et al., 2009) document that transient investors engage in corporate governance mechanism which encourage managers to pursue myopic management practices. Thus managers which are governed by transient investor base have either a direct financial interest to cut R&D expenses (and by doing so increase short-term earnings) through compensation schemes or they face a higher risk of management turnover. Distinguishable from investors' impact on R&D investments is their ability to observe value enhancing strategies through these investments. Yan and Zhang (2009) document that transient investors possess superior skills in uncovering short-term earnings deviations on which their investment decisions are based.

To sum up, finance and accounting literature often argues that high R&D intensity is related to low turnover, i.e. long-term oriented investors. However, we find that low turnover is related to superior IT capability and co-present with *low* R&D intensity rather than high R&D intensity. Thus, we have a strong indication that our finding regarding turnover in R&D-active industries exhibiting superior IT capability is not pre-determined by R&D intensity. However, many industries of our sample do not exhibit R&D expenses anyway (e.g. banking) and thus are not affected by potential biases through R&D intensity.

6 Conclusion

6.1 Discussion

In accordance with Bharadwaj (2000) and Santhanam and Hartono (2003) we use secondary statistics as proxy for IT capability to increase reliability. This measure for IT capability is combined with ownership measures derived from the finance and accounting literature (cf. Gaspar et al., 2005) to explore the hypothesized relation between a firm's ownership structure (i.e. its turnover) and superior IT capability. Specifically, we compare differences in ownership structure and IT capability in subsequent periods.

Our results show that firms characterized by low ownership turnover and thus long-term oriented investors exhibit superior IT capability, reflected by the IW ranking, when compared to the industry average. These results are consistent throughout the investigated ten year time window. The results remain consistent after applying several tests for robustness such as using 2-level and 4-level SIC codes, R&D intensity as control variable, turnover variable calculated for a year's average and for one quarter, relating IW ranking and turnover by using one, two, and three year lag). By exploring this relation for the last decade and testing for different time lags and additional influential effects, i.e. R&D effects, our findings reveal a significant relationship between firm ownership and IT capability and therefore answer the research question such that there is a relationship between these two concepts. As argued in our research model and in analogy to previous research, this emphasizes the important role of an organizational IT capability and adds another aspect in this debate.

6.2 Contribution

Our research addressed the question, how a firm's ownership structure is related to its IT capability.

Using secondary data of the 13 years-time period from 1997 to 2009 and drawing on finance literature and research on IT capability, the answer we found is that low ownership turnover – representing long-term oriented owners – precedes superior IT capability.

We contribute to our understanding of IT capability by showing that certain types of owners promote the development and deployment of a firm's IT capability, leading to a superiority that by other research has been shown to influence strategic topics. Result show that IT investment decisions that typical render effects in the long-term must be backed by investors whose investment horizon is also long-term. Such investors provide the required flow of capital and reduce pressures on management to predominantly focus on short-term goals.

6.3 Limitations

At this point a few limitations of our approach should be mentioned. First, employing data from a database implies the use of proxies for IT capability. These proxies are commonly defined for all firms but do not allow looking into details and thus may comprise aspects which are not accounted for by the use of our theoretical concepts. Furthermore, we are not able to distinguish between different types of IT capability such as relationship capability or IT infrastructure capability. Second, we used a single measure to determine a firm's turnover and thus its ownership structure. However, future research should comprise more indicators to cover additional aspects of ownership and also other measure for turnover to increase the generalizability of our results.

6.4 Managerial implication

This research offers several considerable thoughts for practitioners from a management perspective as well as from an investor's point of view. By actively managing the ownership structure, especially attracting and satisfying long-term investors, management can focus on investments and the development of long-term capabilities for stable organic growth without extensive pressure by exploitative investors and the fear of capital drain. From an investor's perspective, taking the ownership structure into account not only can prevent myopic management (Bushee, 1998; Mizik, 2010) but also fosters the long-term engagement of investors and firm development that in turn increases the likelihood of stable future returns.

Superior IT capability is no commodity and differentiates from competitors. Building IT capability takes time and cannot be imitated easily. Thus, it is a strategic asset. Developing and deploying an IT capability entails costs and long lead times that need to be backed by investors with long-term investment horizons. Top management should take this into account, but on the other side have in mind that these certain types of investor in turn might exert influence on corporate decisions.

6.5 Further Research

This study is a first step into a new direction by linking research on IT capability with financial market structures, especially firms' ownership structures. Hence, there are various possibilities to draw on and to extend research. One is a deeper investigation of the ownership structure by examining more detailed measures of ownership (e.g. Bushee, 1998) or extending research by comparing privately held companies, especially those from the InformationWeek ranking. Another necessary step will be to test for other potential factors of influence, such as marketing capability or intensity. Furthermore, research may go beyond the methodology of group comparisons and employ longitudinal research that might provide additional valuable findings.

7 References

Andreu, R. and Ciborra, C. (1996). Organisational Learning and Core Capabilities Development: The Role of It. Journal of Strategic Information Systems, 5 (2), 111-127.

Asif, Z. and Schuff, D. (2005). A Process Based Framework for Assessing It Value. In Proceedings of the Eleventh Americas Conference on Information Systems, Omaha, NE, USA.

Bharadwaj, A., Sambamurthy, V., and Zmud, R. (1999). It Capabilities: Theoretical Perspectives and Empirical Operationalization. In Proceedings of the Twentieth International Conference on Information Systems, Charlotte, North Carolina, USA.

Bharadwaj, A.S. (2000). A Resource-Based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation. MIS Quarterly, 24 (1), 169-196.

Bhatt, G.D. and Grover, V. (2005). Types of Information Technology Capabilities and Their Role in Competitive Advantage: An Empirical Study. Journal of Management Information Systems, 22 (2), 253-277.

Brynjolfsson, E. and Hitt, L.M. (1998). Beyond the Productivity Paradox. Communications of the ACM, 41 (8), 49-55.

Brynjolfsson, E. and Hitt, L.M. (2003). Computing Productivity: Firm-Level Evidence. Review of Economics & Statistics, 85 (4), 793-808.

Bushee, B.J. (1998). The Influence of Institutional Investors in Myopic R&D Investment Behavior. Accounting Review, 73 (3), 305-333.

Chi, L., Ravichandran, T., and Andrevski, G. (2010). Information Technology, Network Structure, and Competitive Action. Information Systems Research, 21 (3), 543-570.

Cornett, M.M., Marcus, A.J., and Tehranian, H. (2008). Corporate Governance and Pay-for-Performance: The Impact of Earnings Management. Journal of Financial Economics, 87 (2), 357-373.

Daniel, K. and Titman, S. (2006). Market Reactions to Tangible and Intangible Information. Journal of Finance, 61 (4), 1605-1643.

Dehning, B. and Stratopoulos, T. (2003). Determinants of a Sustainable Competitive Advantage Due to an It-Enabled Strategy. The Journal of Strategic Information Systems, 12 (1), 7-28.

Dikolli, S.S., Kulp, S.L., and Sedatole, K.L. (2009). Transient Institutional Ownership and Ceo Contracting. Accounting Review, 84 (3), 737-770.

Duliba, K.A., Kauffman, R.J., and Lucas Jr, H.C. (2001). Appropriating Value from Computerized Reservation System Ownership in the Airline Industry. Organization Science, 12 (6), 702-728.

Galbraith, J.R. (1974). Organization Design: An Information Processing View. Interfaces, 4 (3), 28-36.

Gaspar, J.-M., Massa, M., and Matos, P. (2005). Shareholder Investment Horizons and the Market for Corporate Control. Journal of Financial Economics, 76 (1), 135-165.

Gillan, S.L. and Starks, L.T. (2007). The Evolution of Shareholder Activism in the United States. Journal of Applied Corporate Finance, 19 (1), 55-73.

Jiang, H. (2010). Institutional Investors, Intangible Information, and the Book-to-Market Effect. Journal of Financial Economics, 96 (1), 98-126.

Joshi, K.D., Lei, C., Datta, A., and Shu, H. (2010). Changing the Competitive Landscape: Continuous Innovation through It-Enabled Knowledge Capabilities. Information Systems Research, 21 (3), 472-495.

Kimbrough, M.D. (2007). The Influences of Financial Statement Recognition and Analyst Coverage on the Market's Valuation of R&D Capital. The Accounting Review, 82 (5), 1195-1225.

Kochhar, R. and David, P. (1996). Institutional Investors and Firm Innovation: A Test of Competing Hypotheses. Strategic Management Journal, 17 (1), 73-84.

Kohli, R. and Grover, V. (2008). Business Value of It: An Essay on Expanding Research Directions to Keep up with the Times. Journal of the Association for Information Systems, 9 (1), 23-39.

Lang, M. and McNichols, M. (1997). Institutional Trading and Corporate Performance. Working paper, Stanford University,

Lee, C., Lee, K., and Pennings, J.M. (2001). Internal Capabilities, External Networks, and Performance: A Study on Technology-Based Ventures. Strategic Management Journal, 22 (6/7), 615-640.
Lin, Q. and Lee, J. (2004). Consumer Information Search When Making Investment Decisions. Financial Services Review, 13 (4), 319-332.
Loibl, C. and Hira, T.K. (2009). Investor Information Search. Journal of Economic Psychology, 30 (1), 24-41.
Melville, N., Kraemer, K., and Gurbaxani, V. (2004). Information Technology and Organizational Performance: An Integrative Model of It Business Value. MIS Quarterly, 28 (2), 283-322.
Mizik, N. (2010). The Theory and Practice of Myopic Management. Journal of Marketing Research (JMR), 47 (4), 594-611.
Munari, F., Oriani, R., and Sobrero, M. (2010). The Effects of Owner Identity and External Governance Systems on R&D Investments: A Study of Western European Firms. Research Policy, 39 (8), 1093-1104.
Oswald, S.L. and Jahera Jr, J.S. (1991). The Influence of Ownership on Performance: An Empirical Study. Strategic Management Journal, 12 (4), 321-326.
Ravichandran, T. and Lertwongsatien, C. (2002). Impact of Information Resources and Capabilities on Firm Performance: A Resource-Based Perspective. In Proceedings of the Twenty-Third International Conference on Information Systems, Barcelona.
Ravichandran, T., Liu, Y., Han, S., and Hasan, I. (2009). Diversification and Firm Performance: Exploring the Moderating Effects of Information Technology Spending. Journal of Management Information Systems, 25 (4), 205-240.
Ray, G., Dazhong, W., and Konana, P. (2009). Competitive Environment and the Relationship between It and Vertical Integration. Information Systems Research, 20 (4), 585-603.
Ross, J.W., Beath, C.M., and Goodhue, D.L. (1996). Develop Long-Term Competitiveness through It Assets. Sloan Management Review, 38 (1), 31-42.
Sabherwal, R. and Kirs, P. (1994). The Alignment between Organizational Critical Success Factors and Information Technology Capability in Academic Institutions. Decision Sciences, 25 (2), 301-330.
Sambamurthy, V. and Zmud, R.W. (1997). At the Heart of Success: Organizationwide Management Competence. In Steps to the Future: Fresh Thinking on the Management of It-Based Organizational Transformation (C. Sauer and P. Yetton Eds.), pp. 143-163, Jossey-Bass, San Francisco.
Santhanam, R. and Hartono, E. (2003). Issues in Linking Information Technology Capability to Firm Performance. MIS Quarterly, 27 (1), 125-153.
Soh, C. and Markus, M.L. (1995). How It Creates Business Value: A Process Theory Synthesis. In International Conference on Information Systems, Amsterdam.
Tallon, P.P., Kraemer, K.L., and Gurbaxani, V. (2000). Executives' Perceptions of the Business Value of Information Technology: A Process-Oriented Approach. Journal of Management Information Systems, 16 (4), 145-173.
Tanriverdi, H., Rai, A., and Venkatraman, N. (2010). Reframing the Dominant Quests of Information Systems Strategy Research for Complex Adaptive Business Systems. Information Systems Research, 21 (4), 822-834.
Thomsen, S. and Pedersen, T. (2000). Ownership Structure and Economic Performance in the Largest European Companies. Strategic Management Journal, 21 (6), 689-705.
Tihanyi, L., Johnson, R.A., Hoskisson, R.E., and Hitt, M.A. (2003). Institutional Ownership Differences and International Diversification: The Effects of Boards of Directors and Technological Opportunity. Academy of Management Journal, 46 (2), 195-211.
Wright, P., Kroll, M., Lado, A., and van Ness, B. (2002). The Structure of Ownership and Corporate Acquisition Strategies. Strategic Management Journal, 23 (1), 41.
Yan, X.S. and Zhang, Z. (2009). Institutional Investors and Equity Returns: Are Short-Term Institutions Better Informed? Review of Financial Studies, 22 893-924.