Institutional Investors and the Development of IT Capability: Evidence from Publicly Listed Companies

Completed Research Paper

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Abstract

Investors often influence the strategic decisions of their holdings, such as long-term orientation and investments in intangible assets. Investigating IT capability as a strategic asset, we examine the influence of institutional shareholders’ investment horizon and blockholdings on the development of organizational IT capability. We perform a panel data analysis of eleven years of archival data from publicly listed U.S. companies. Our findings show a positive relationship between a firm’s ownership structure and the development of its IT capability. In particular, we find that equity owners that remain invested over long periods of time increase firms’ likelihood of developing a continuous IT capability. In contrast, investors that can be classified as blockholders do not exert significant influence on their portfolio firms. By linking accounting research on firm ownership with ongoing IS research on IT capability, we provide new insights into the firm-level benefits of long-term oriented institutional investors on IT capability.

Keywords: Institutional Investors, Corporate Ownership, IT capability, Econometric Analysis

Introduction

Investors’ influence on the strategic decisions and competitive actions of firms is frequently discussed in finance and accounting research. In particular, it has been shown that investors influence strategy (Tihanyi et al. 2003; Wright et al. 2002) and performance (Cornett et al. 2007; Dalton et al. 2003), but also innovation (Bushee 1998; Kochhar and David 1996). Research provides evidence that investors influence on strategic topics, such as long-term investments in intangible assets, depends on certain characteristics (Bushee 1998; Gaspar et al. 2005; Lin and Lee 2004; Loibl and Hira 2009).

Prior research distinguishes various types of investors based on different classifications. Bushee (1998), for example, argues that investors holding large blocks of shares are inclined to monitor a firm’s actions more closely and are actively engaged in strategic moves. Such investors typically employ strategic control systems (Munari et al. 2010) and are interested in intangible assets (Cormier et al. 2009; Daniel and Titman 2006; Jiang 2010). In general, the various types of investors that together form a firm’s ownership structure have different interests and, accordingly, behave in different ways.

As is the case for R&D, investments into IT have increased constantly over the last decades. Global IT spending accounted for over 2 trillion dollars in 2004 (Asif and Schuff 2005) and easily exceeds billions of dollars in large multinational firms (Ray et al. 2009). Corporate IT expenditures are not only dedicated to the acquisition or development of hardware and software. A fair amount is also spent on developing the so-called organizational IT capability that supports strategic objectives (Ross et al. 1996). This is achieved...
by dedicating a combination of IT resources and complementary organizational resources (Melville et al. 2004) to develop an IT capability. In this context, the strategic benefits of IT resources in achieving competitive advantage have been heavily discussed in IS research (e.g., Bhatt and Grover 2005; Dehning and Stratopoulos 2003). Other studies document that superior IT capability positively affects various performance measures (Bharadwaj 2000; Santhanam and Hartono 2003; Wang and Alam 2007), innovation (Aral and Weill 2007; Gordon and Taraftar 2007), and inter-firm relationships (Rai et al. 2012). Nevertheless, developing an IT capability requires time and effort. “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. Thus, strategic advantages can be attained by companies “that can exploit IT functionality on a continuous basis” (Bharadwaj et al. 1999, p. 383).

Overall, IS research demonstrates the strategic value of IT and conceptualizes IT capability as a complex and time-dependent intangible asset (Brynjolfsson and Hitt 2003; Lim et al. 2012a; Tallon et al. 2000).

Considering the discussion about IT capability as a complex, path-dependent, and intangible asset that affects various outcomes, it seems reasonable that certain types of investors are interested in the development of IT capability to maximize their long-term shareholder value. Current studies show that investors are increasingly active in influencing firm strategy and investment levels “by confronting poorly managed firms with public criticism of their policies, initiation of shareholder proposals, negotiations with managers, and on rare occasions, launching proxy contests” (Ravichandran et al. 2009, p. 681). This is in line with findings of Becht et al. (2009, p. 3095) who argue that “public ‘naming and shaming’ via focus lists and filing nonbinding shareholder proposals in proxy statements” is common in the United States. A current example is a letter sent in March 2014 by Laurence Fink, the CEO and Chairman of BlackRock, the world’s largest and probably most influential investment company in recent years. Addressed to every chairman and CEO in the S&P 500, his letter encouraged them to focus on long-term growth strategies1. Another example of this kind of influences are expectations of investors regarding IT’s potential for commercializing goods, leading to respective inquiries requesting an electronic commerce strategy and to firm’s reactions signaling back that they appropriately invest in e-commerce to gain external legitimacy (Ravichandran et al. 2009).

We argue that certain types of investors holding shares of a firm are conducive to developing an IT capability while other investors prevent firms from building up such capability. Finance and accounting research demonstrates that investors not only provide financial means but also influence a firm’s market valuation in general and specific management decisions in particular (e.g. Gaspar et al. 2013; Khurana and Moser 2013; Neubaum and Zahra 2006). A firm’s ownership structure could thus be a major influencing factor on developing and sustaining an IT capability, or put another way, an indicator of the extent to which IT is regarded as a strategic asset. A continuous IT capability that is sustained over several years is often referred to as a superior IT capability in IS literature. Studies show that especially a superior IT capability results in strategic and competitive advantages which, in turn, match the interests of certain types of investors. Despite the strategic importance of a firm’s ownership structure, which is composed of different types of investors, there is a lack of studies investigating the relationship between a firm’s ownership structure and its IT capability. We address this issue by posing the following research question:

*To what extent is a firm’s superior IT capability influenced by its ownership structure?*

To address this question, we develop a research model by arguing that certain types of institutional shareholders, distinguished by characteristics such as trading behavior and blockholdings, affect the development of a firm’s IT capability. Empirically, we analyze longitudinal data on IT capability published by InformationWeek (cf. Bharadwaj 2000; Santhanam and Hartono 2003) in combination with financial and accounting data from the Worldscope database and institutional equity ownership data (cf. Bushee 1998; Giachetti 2013), both provided by Thomson Reuters.

This study links previously unconnected research on firm ownership from accounting literature with IS research on IT capability. We thereby strive to contribute to both accounting literature by extending research on an important hitherto neglected intangible asset, as well as IS literature by demonstrating the link to an important antecedent of IT capability. This research is practically relevant to investors and top

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management. It gives investors insights into another important intangible asset and its dependence on other investors’ interest and guides executives in actively managing their firm’s ownership structure by attracting investors who promote long-term oriented investments and the development of organizational capabilities.

In the following, the paper first introduces the concepts of firm ownership and IT capability. Subsequently, the research model and hypotheses are developed. In the methodology section the sample and measures of variables are presented. This is followed by the results from the empirical analysis. Finally, we discuss our findings and their implications.

Background

Equity Ownership and Institutional Investors

By the end of the 20th century individual investors had lost their dominance as the prevalent owners of large corporations to institutional investors. These institutional investors, such as insurance companies, banks, or mutual and pension funds, currently hold more than 70 percent of publicly listed U.S. companies (Gillian and Starks 2007). Regulated by the U.S. Security Securities and Exchange Commission (SEC), institutional investors are defined as investment managers who administer more than $100 million in equity securities for their own account or on behalf of third parties. Some institutional owners like pension and hedge funds are considered an influential group of activists that pressure management behind-the-scenes, submit shareholder proposals and resolutions, and used the media to target the management and boards of poorly governed or performing companies (Gillian and Starks 2007; Ryan and Schneider 2002). Over time, institutional investors have become dominant players in financial markets, that actively monitor firms’ behavior and influence firms’ decisions (Connelly et al. 2010b).

Institutional investors trade, that is buy, hold, and sell shares, and thereby express their assessment of a firm’s performance and value. But institutional investors may also closely monitor and influence companies, their corporate governance (Aggarwal et al. 2011; Cadman and Sunder 2014; Connelly et al. 2010a; Shin and Seo 2011) and decision-making processes. Studies have shown that shareholders influence corporate actions in mergers and acquisitions (Ferreira et al. 2010; Goranova et al. 2010), investments (Brossard et al. 2013; Munari et al. 2010), dividend policies (Derrien et al. 2013; Gaspar et al. 2013), financial reporting and taxation (Khurana and Moser 2013; Ramalingegowda and Yu 2012), corporate changes (Gillian and Starks 2007; Neubaum and Zahra 2006), and other areas.

Several classifications of institutional investors have been put forward to investigate these types of shareholder influences and the activism they exhibit. Frequent classifications encompass investor types such as banks and insurance companies, investment advisors, or different forms of funds like mutual and pension funds (David et al. 1998; Lang and McNichols 1997), shareholders investment horizon ranging from short- to long-term orientation (Gaspar et al. 2005; Yan and Zhang 2009), and investor behavior (Bushee 1998; Bushee 2001; Bushee and Noe 2000).

IT Capability

A firm’s IT capability is the basis for achieving advantages from IT investments (Duliba et al. 2001) and depends on the firm’s ability to transform these investments into assets that may form a unique IT capability over time (Ravichandran and Lertwongsatien 2002). IT capability as the “ability to sustain IT innovation and respond to changing market conditions through focused IT applications” (Bharadwaj et al. 1999, p. 381) has been shown to result in higher firm performance (Bharadwaj 2000; Santhanam and Hartono 2003).

Research provides broad evidence of the benefits and outcomes of IT capability, including sustained competitive advantage (Dehning and Stratopoulos 2003), innovation and new products (Aral and Weill 2007; Gordon and Tarafdar 2007), and inter-firm relationships (Rai et al. 2012). For example, Muhanna and Stoel (2010) show that IT capability is associated with future accounting earnings. From a market perspective, Wang and Alam (2007) provide evidence that IT capability is, besides standard accounting information and book value, positively associated with market value. Thus, the literature on IT capability provides extensive evidence that superior IT capability is a strategic asset that results in superior performance as well as in strategic and competitive advantages.
Research Model

Studies show that institutional investors exhibiting high portfolio turnover have short-term investment horizons (Gaspar et al. 2005) that are positively associated with myopic investment behavior (Bushee 1998). Myopic behavior refers to earnings management by avoiding investments or cutting costs for long-term projects to meet short-term goals (Bushee 1998). In particular, transient institutional investors, who frequently trade stocks and hold small stakes in a large number of firms, increase pressures for myopic investment behavior. They intend to increase current earnings by lowering expenditures and thereby maximize the current market value and trading profits. Dedicated investors in turn hold concentrated portfolios of large, long-term positions in a few companies. Thus, they have a strong interest in monitoring managers and alleviate pressures for myopic investment behavior (Bushee 1998). Quasi-indexing owners, who replicate stock indices, exhibit a long-term horizon like dedicated owners and are not likely to trade for short-term goals (Ke and Petroni 2004). They rather construct broad portfolios that emulate the characteristics of a market index, such as the S&P 500 (Ryan and Schneider 2002). Thus, quasi-indexing owners more closely follow a firm’s position in an index, meaning whether a firm is part of an index or not and what weight the firm has within an index. The weight of a firm depends mostly on the market valuation as an expression of future prospects, which also reflects strategic assets. The market valuation is in part influenced by quasi-indexing investors themselves but also by other market participants. However, trading depends on index development rather than on short-term earnings. Overall, long-term oriented institutional investors “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, depending on their investment horizon, are likely to influence corporate decisions towards investing in IT. Managers might be supported or even pushed to invest in intangible assets, including continuous investments to develop and employ an organizational IT capability. Investors with long-term investment horizons are by definition inclined to dedicate capital rendering effects in the long-term and one way to do this is to support the development and deployment of a firm’s IT capability. They further reduce incentives for myopic behavior and support decisions towards investments with effects in the long-term. In particular, firms with a high share of dedicated owners might be able to develop IT capability due to the long-term investment horizon and the valuation of intangible assets expressed by their monitoring activities. In particular, the latter may positively influence strategic competitive actions (Connelly et al. 2010b; Yan and Zhang 2009) and might be a difference to quasi-indexers. Having a high share of quasi-indexing investors might also support the development of IT capability because of the long-term investment horizon which, however, depends on an index’s development and might not be the result of close monitoring of a firm’s actions. In contrast, high shares of transient owners support myopic behavior and can be expected to prevent the development of a firm’s IT capability. Therefore we hypothesize:

H1: Higher shares of long-term oriented institutional investors will positively influence the development of a firm’s superior IT capability in subsequent periods.

Another characteristic of investors that is often argued to be associated with activism and corporate influence is blockholding, or in particular institutional stock ownership that exceeds more than five percent of a firm’s total shares. These comparably large blocks of shares generate an interest in more closely monitoring a company’s activities, such as by gathering information outside the balance sheet (Bushee 1998). Accordingly, those investors employ appropriate control systems (Munari et al. 2010) and look for intangible assets (Cormier et al. 2009; Daniel and Titman 2006; Jiang 2010). Thus, investors holding large blocks of shares in single companies are strongly inclined to exert explicit monitoring and ensure that intangible assets can be developed over time (Bushee 1998). Consequently, we argue that investors who hold large blocks of shares are more engaged in their portfolio firms’ strategic moves and influence these companies to protect intangible assets to assure the future value of their investments.

H2: Institutional investors that hold large blocks of shares will positively influence the development of a firm’s superior IT capability in subsequent periods.
Methodology

Data and Sample

To study the relationship between firm ownership and superior IT capability we merge data from three different sources. First, financial and accounting data such as capital expenditure and return on assets is obtained from the Worldscope database.

Second, proxy data on IT capability is derived from the publicly available InformationWeek (IW) 500 ranking. On an annual basis, IW ranks the 500 biggest and best corporate users of information technology. For the past 25 years, IW has surveyed CIOs and senior IT managers to collect different measures from technical parameters to questions regarding IT usage. Thus, the ranking provides a more complete picture of a company’s IT landscape than pure investment measures and also incorporates intermediate effects such as IT usage at the process level, which is a common criticism of highly aggregated and abstract measures. The ranking reflects central elements of IT capability and can serve as an (admittedly incomplete) proxy for IT capability. High response rates and experienced respondents are some of the benefits of using the IW data (Lin and Bush 2010). The ranking has been used widely as a proxy of IT capability in past (e.g. Bharadwaj 2000; Santhanam and Hartono 2003) and recent academic studies (Chen et al. 2011; Lim et al. 2012b; Lin and Bush 2010; Muhanna and Stoel 2010; Wang and Alam 2007). Especially because there is little comparable data on IT capability available (Kohli and Grover 2008), we follow this tradition and consider a listing in the ranking as proxy of IT capability for the given year.

Third, stock ownership and institutional investor characteristics are calculated from institutional equity holdings. According to Security and Exchange Commission (SEC) Rule 13f, institutional investors or institutional investment managers active in the U.S. stock market that administer more than $100 million in equity securities on own accounts or on behalf of others have to file their stockholdings with the SEC (see Wines (1990) and Giachetti (2013) for a detailed discussion of 13F filings). Consolidated institutional stock holdings based on 13F filings are available through Thomson Reuters Ownership and Profiles (OP) data feed.

In sum, our panel dataset consists of aggregated IW and ownership data of 540 individual firms listed on a U.S. stock exchange, encompassing 5,208 firm-year observations from 1998 to 2008. Non-publicly listed companies are excluded from our sample because information on shareholdings is not available.

Measures

To determine a firm’s superior IT capability we created a dummy variable that indicates if a firm consistently provides above average IT performance. Bharadwaj (2000) suggests at least two appearances in the IW 500 ranking within rolling four-year windows as a valid proxy for a firm’s superior IT capability. The underlying assumption infers a continuous or superior IT capability from a repeated ranking. We followed this definition and created a forward directed dummy variable for superior IT capability. If a company is listed at least twice in four future issues of the IW ranking (i.e., t+1 to t+4) the dummy variable for the current period (t0) is coded as 1. We further required more strictly that a firm has to be ranked in t+1 and at least one more time in the remaining three years. We thereby avoided the emergence of varying gaps among firms, such as if one company is only ranked in the first two years and another company only in the last two years. To analyze data in the timeframe from 1998 to 2008 we used IW 500 rankings up to 2012 (e.g., for t0=2008 we used the IW 500 rankings from t+1=2009 up to t+4=2012). Following this logic, we coded an additional dummy variable for robustness checks that is set to 1 if a company has been ranked twice within three instead of four years.

To operationalize the ownership characteristics of institutional investors, we adopted two measures from the literature. Bushee (1998) calculates several measures for institutional investors based on their trading and portfolio characteristics. In particular, we adapted the measure of the relative stability of institutional investors’ holdings from his conceptualization that reflects the long-term orientation of a firm’s institutional shareholders. Our stability variable (STAB) measures the percentage of a firm’s shares that are held by institutional investors for at least two years. Our second measure indicates the percentage of shares held in large blocks (BLOCK). In particular, for each firm we aggregated all institutional
blockholdings, that are all equity holdings by institutional investors that exceed a five percent share in the firm (David et al. 2001). For robustness checks we additionally measured the percentage of shares held by the largest institutional blockholder. Table 1 provides an overview of the ownership variables. The variables were calculated at the quarterly level and averaged by year.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Formula</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAB</td>
<td>Stability of holdings (percent of shares held for at least two years)</td>
<td>$STAB_{kt} = \left( \sum_{i} \frac{s_{kit} \cdot LT_{kit}}{s_{kit}} \right) / \sum_{i} s_{kit}$</td>
<td>(Bushee 1998)</td>
</tr>
<tr>
<td>BLOCK</td>
<td>Blockholdings (percent of shares held in large blocks greater than 5 percent)</td>
<td>$BLOCK_{kt} = \left( \sum_{i} \frac{s_{kit} \cdot LB_{kit}}{s_{kit}} \right) / \sum_{i} s_{kit}$</td>
<td>(David et al. 2001)</td>
</tr>
</tbody>
</table>

$s_{kit} =$ shares held by investor i in firm k at end of quarter t.
$LT_{kit} =$ 1 if investor i held firm k continuously for prior eight quarters, 0 otherwise.
$LB_{kit} =$ 1 if percentage of total shares in firm k held by investor i at end of quarter $t > 0.05$, 0 otherwise.

We included a set of different firm-level control variables in our empirical analysis. First, to control for firm size we incorporated the log value of sales (SIZE). As suggested in prior research on IT capability we controlled for past performance in terms of return on assets (ROA) (Santhanam and Hartono 2003) which is a measure for the profitability of a company’s assets in terms of generating revenue and is calculated as net income divided by average total assets. Additionally, we controlled for leverage (LVG), which is calculated as the ratio of long term debt to shareholders equity. Thus, LVG reflects the potential influence by debt holders. Furthermore, we controlled for capital expenditure (CAPEX), which is the sum of all expenditures for the acquisition and development of physical assets such as buildings and equipment, including software licenses. CAPEX thus reflects a company’s investment activity. Both measures were scaled by sales and winsorized at the one percent level to exclude potential effects driven by outliers. Where appropriate, we also considered time invariant control variables such as industry effects in terms of one digit SIC code. Time effects were included to account for external events that affect all companies in a given year.

**Method**

Panel data combines cross-sectional and time-series data on different companies and thereby allows changes in repeatedly observed variables to be analyzed across time. Common models for panel data analysis are fixed-effects and random-effects models (Wooldridge 2010). These models imply different assumptions that need to be tested to determine the correct model specification in the present context. One major advantage of panel models over cross-sectional models is their ability to control for company-specific or individual heterogeneity (Baltagi 2008). Further, panel methods permit the analysis of lags including the consequences of influences and decision making. This kind of analysis is especially important because many actions have implications at a subsequent date, as in our case. The panel methods allow us to investigate the hypothesized influence of changes in institutional ownership on firms’ likelihood to develop a superior IT capability in subsequent years.

**Results**

To test whether a firm’s superior IT capability depends on its past ownership structure and investors’ behavior, we applied a binary outcome model (Cameron and Trivedi 2010; Wooldridge 2010). Superior IT capability was regressed on our two ownership characteristics and additional control variables over the period from 1998 to 2008. The logistic panel regression predicts the probability of having a superior IT capability given the composition of different institutional investor types as described above.

Table 2 presents the means and standard variations as well as the correlations among the variables. Correlations among the variables are all smaller than 0.50. Variance inflation factors (VIFs) are less than 1.65 for all variables with a mean of 1.26. The VIF values are below the common threshold of 5, suggesting
no substantial multicollinearity in our data (Hair et al. 2010). The percentage of firms per year with a superior IT capability ranges between 27 and 48 with an overall average of 40 percent (see Table 3).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs.</th>
<th>Mean</th>
<th>SD</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) ITC</td>
<td>5208</td>
<td>0.396</td>
<td>0.489</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>(2) CAPEX</td>
<td>5208</td>
<td>0.056</td>
<td>0.060</td>
<td>0.027</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>(3) SIZE</td>
<td>5208</td>
<td>8.493</td>
<td>1.355</td>
<td>0.118</td>
<td>-0.020</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) LVG</td>
<td>5208</td>
<td>0.886</td>
<td>2.216</td>
<td>0.014</td>
<td>-0.003</td>
<td>0.073</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5) ROA</td>
<td>5208</td>
<td>0.040</td>
<td>0.083</td>
<td>0.042</td>
<td>-0.204</td>
<td>0.149</td>
<td>-0.080</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6) STAB</td>
<td>5208</td>
<td>0.484</td>
<td>0.193</td>
<td>0.070</td>
<td>-0.094</td>
<td>0.179</td>
<td>0.038</td>
<td>0.122</td>
<td></td>
</tr>
<tr>
<td>(7) BLOCK</td>
<td>5208</td>
<td>0.150</td>
<td>0.129</td>
<td>0.007</td>
<td>-0.137</td>
<td>-0.219</td>
<td>0.028</td>
<td>-0.151</td>
<td>0.504</td>
</tr>
</tbody>
</table>

We applied both binary logistic fixed-effects and random-effects panel regression to test our hypotheses. In the fixed-effects model, the effects within each firm were estimated by a maximum likelihood estimator (MLE). Therefore time-invariant regressors such as industry variables are not identified and cannot be estimated. The estimation results are presented in Table 4. The first model shows a positive effect of firm size indicating that large firms are more likely to develop superior IT capability. The results are unchanged if we use the log value of assets instead of sales to control for firm size.

The model shows positive and significant effects of long-term oriented investors (STAB), i.e., investors that do not frequently change their ownership positions in a firm in the short-term. This result indicates that long-term orientated institutional investors influence firms in their development of IT capability. H1 is therefore supported. The estimated effect of owners with large block holdings, however, is not significant. Contrary to our expectations, investors that own large shares of a firm do not influence IT capability. Based on the results, we have to reject H2. Additionally, we control for a potential interaction
effect among long-term orientated investors (STAB) and blockholders (BLOCK) that might explain the unexpected outcome of H2. However, the results remain largely unchanged and the interaction effect is also not significant.

In general, the random- and fixed-effects models show comparable results although of different magnitude. Conducting a Hausman test indicates that the estimates of the random-effects models are not consistent with the fixed-effects estimates (p < 0.001) and therefore, the estimates of the fixed-effects model are preferable.

### Table 4. Results of Regression Analysis

<table>
<thead>
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<th>(1)</th>
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<th>(3)</th>
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<td>Fixed-Effects</td>
<td>Random-Effects</td>
<td>Random-Effects</td>
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<td></td>
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<td>(0.0727)</td>
<td>(0.0453)</td>
<td>(0.0453)</td>
<td>(0.0536)</td>
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<tr>
<td>SIZE</td>
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<td>1.1679***</td>
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<td>0.3446***</td>
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<td></td>
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<td>(0.1670)</td>
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<td>(0.0444)</td>
<td>(0.0378)</td>
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<td>0.0846</td>
<td>0.0748</td>
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<td>0.0758</td>
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<td></td>
<td>(0.0460)</td>
<td>(0.0461)</td>
<td>(0.0402)</td>
<td>(0.0403)</td>
<td>(0.0406)</td>
</tr>
<tr>
<td>STAB</td>
<td>0.2764**</td>
<td>0.2679**</td>
<td>0.2556***</td>
<td>0.2595***</td>
<td>0.2455***</td>
</tr>
<tr>
<td></td>
<td>(0.0846)</td>
<td>(0.0859)</td>
<td>(0.0579)</td>
<td>(0.0585)</td>
<td>(0.0584)</td>
</tr>
<tr>
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<td>-0.0201</td>
<td>-0.0035</td>
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<td>(0.0529)</td>
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<td>(0.0449)</td>
<td>(0.0345)</td>
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<td>Goodness of fit (LL)</td>
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<td>-2052</td>
<td>-3219</td>
<td>-3218</td>
<td>-3212</td>
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</table>

Notes: Standardized regression coefficients are reported. Standard errors are in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001, all tests are two-sided.

We performed several robustness checks. First, we estimated our models with non-winsorized independent variables. The mean values and standard deviations are slightly higher but all differences are moderate. The results (not tabulated) from this analysis are consistent with the tabulated findings. Second, as described above, we defined superior IT capability more strictly. We set the dummy to equal
one only if two conditions are met: (a) the company was ranked in the current year, and (b) the company was ranked in at least one out of the two subsequent years. The results (not tabulated) again show qualitatively comparable results to our main analysis. Third, we substituted our blockholder variable of all institutional investors by shareholdings of the largest blockholder. Again, the results remain qualitatively unchanged and our blockholder variable non-significant. Fourth, we used one year lagged values of our institutional investor variables. The ownership effects remain the same. Finally, we limited our analysis to large companies that are part of the S&P 500 index. This reduced our sample size to 323 companies but all effects are consistent with the unrestricted sample.

Discussion

Investigating the ownership structure of publicly listed firms and their IT capability over an eleven-year period, we examined to what extent a firm’s superior IT capability is influenced by its institutional shareholders. Before discussing the results, limitations are addressed to allow the interpretation of results while considering these limitations.

One limitation is the use of proxies for IT capability and ownership. These proxies relate to the concepts but are rather rough, especially for IT capability. Thus, not all aspects of the theoretical concept can be covered. Further, we only investigate companies from the historic IW 500 universe. The IW dataset is restricted to 500 observations of public and private companies each year which we combined to a longitudinal panel dataset. Unfortunately, other more comprehensive datasets are not publicly available (Kohli and Grover 2008). This limits the generalizability of our empirical results to other companies not included in the ranking but at the same time allows us to preclude a potential selection bias we might have introduced otherwise. Further, as these non-ranked companies would not exhibit any changes in IT capability due to missing observations, panel methods such as fixed-effects models would drop these firms anyway in the analysis process. It should be noted that other companies as well develop and possess a superior IT capability. Corresponding activities however remain opaque and unobservable to researchers when using the IW dataset.

Theoretical contributions

Our research provides several contributions. Building on IS research about IT capability in combination with finance and accounting research on investor characteristics we connect two research streams to shed light on a previously unnoticed but important factor – ownership structure – that influences IT capability. We find that only long-term oriented investors with stable portfolios are associated with the development of superior IT capability. We argued that such owners value the development of intangible assets to ensure future earnings and thus both support managers to invest in long-run IT projects and actively monitor and influence respective decisions.

Furthermore, contrary to our hypothesis, our results show no effect of blockholdings on developing IT capability. A possible explanation might be rooted in the argument of risk aversion. In order to hold large blocks of a company, owners must invest a significant sum of money, which might make them reluctant to invest in risky projects (Munari et al. 2010). Although we find a negative relationship between blockholdings and developing IT capability, it is not statistically significant. Furthermore, those blockholding owners might exert power on management but also on other owners. This offsets the need to find agreements on strategic directions and may lead to an inclination to impose own ideas without a counterbalancing discussion which might limit informed decision-making.

To summarize, our study contributes to theory by revealing an important antecedent to the development of a strategic asset – IT capability. This antecedent is based on institutional investor characteristics that have been broken down into two elements (investment horizon and blockholding) to shed further light on this relationship.

Practical contributions

Our research offers several insights for practitioners. For managers, our results point to a hitherto neglected factor influencing IT capability building. In particular, managers can benefit from analyzing the ownership structure of their company with regard to shareholder orientation and expectation. Being
aware of shareholder interests and their behavior provides top managers opportunities to actively manage a firm’s ownership structure (Useem 1996), for example by proactively communicating and emphasizing the value of their intangible assets to owners and potential investors, or by acting according to their shareholder interests when developing and maintaining their IT capability.

The results are particularly important to CIOs because the ownership structure affects their strategic actions and relations to other executives. If the ownership structure includes investors with long-term investment horizon, our results show that IT is valued as a strategic intangible asset. This facilitates necessary and continuous investments for creating and sustaining a superior IT capability. At the same time, emphasizing the investors’ interests in strategic IT investments to the CEO will strengthen the role of the CIO in the top management team.

Long-term investors can gain insights from analyzing their investment peers. Studying current shareholders and their behavior enables investors to make inferences about fellow investors’ corporate influence. In certain circumstances, long-term investors are better off avoiding investments in firms that are susceptible to delay, reduce, or even halt investments in capabilities – like IT – that are essential for future business activities. Regaining lost ground in subsequent periods will be costly and reduce future earnings, thereby making investments in such firms less attractive.

For vendors of IT products and services, our results help identify companies more likely to focus on and develop superior IT capability, respectively firms with stable and long-term oriented investors. These companies may provide more sales potential than firms susceptible for earnings management and cost cutting.

**Further research**

Our research answers some questions but also opens up new ones that could be addressed by further research. This includes exploring additional investor characteristics that might influence IT capability. A more comprehensive picture facilitates the profiling of investors, for example for investor relation departments. Future research could also consider the influence of the age of a company. Distinguishing between newly founded companies and companies that have been listed for several years could reveal interesting insights. It may also be worthwhile to investigate the effect of IT capability on ownership structure as the counterpart to ownership structure influencing IT capability. A firm’s organizational IT capability might influence the ownership structure at a later point in time by attracting certain groups of investors. Future research could explore that issue and discuss the underlying principles for this kind of a relationship.

**References**


Cameron, A. C., and Trivedi, P. K. 2010. *Microeconometrics Using Stata* (Revised ed.), College Station, Texas: Stata Press.


