CONTINGENCY OF THE MULTINATIONALITY-PERFORMANCE-RELATIONSHIP? A COMPARISON OF DIFFERENT FIRM-SPECIFIC ENDOWMENTS CONCERNING INTANGIBLE ASSETS AND CAPITAL-INTENSITY

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ABSTRACT

We analyze the impact of multinationality on performance for a sample of listed firms stemming from France, Germany, and Italy for the period from 1990 to 2006. In accordance with recent research we were able to show that there is a non-linear effect of multinationality on performance. Yet, unlike Lu and Beamish (2004) but in accordance with Ruigrok et al. (2007) we found an inverted-S-curve in the case of our sample. In line with previous studies, our findings support arguments from the intangible asset theory and theories of industrial organization: the effect multinationality exerts on performance obviously depends to a large extent on the existence of firm specific intangible assets (especially related to R&D) and/or the potential to reap economies of scale through internationalization. Furthermore, our findings documents distinct differences regarding the multinationality-performance-relationship between RD-intensive and less RD-intensive firms as well as between capital intensive and less-capital intensive firms.

1. INTRODUCTION

The relationship between multinationality and firm performance is one of the fundamental and most fascinating questions in international business research (Peng, 2004; Verbeke & Brugman, 2009). Despite the substantial number of studies regarding this topic, the findings are quite inconclusive and contradictory up to now. Whereas some authors argue that multinationality increases performance, others come to the opposite conclusion, i.e. that multinationality has a negative effect and still others find that multinationality leads to an increase in performance if certain conditions are fulfilled and does not lead to an improvement in performance or even reduces performance in the absence of these conditions.

When analyzing extant research on the relationship between multinationality and performance (M-P-relationship) two distinct streams of research become apparent: one stream of research is focussing on the impact of multinationality on accounting-based performance (M-ABP-research), and the other is concentrating on the valuation effects of corporate multinationality (M-V-research). Whereas the former is based on empirical studies on firms from a variety of countries and has adopted the idea of a non-linear M-P-relationship for quite a long time, the latter is deeply rooted in US-research with the relevant studies being almost exclusively based on samples of US-firms and up to now almost completely assuming a linear M-P-relationship.

In the M-ABP-research different kinds of non-linear relationships have been analyzed. The most recent approach is the conjecture that the M-P-relationship can best be characterized by an S-shaped-curve (Contractor, 2007; Lu/Beamish, 2004): starting in a first stage where liabilities of foreignness lead to a decrease in performance when multinationality increases, followed by a second stage where processes of organizational learning and knowledge accumulation contribute to a state where the liabilities of foreignness can be overcome and the benefits of multinationality lead to increasing performance as multinationality increases, and finally followed by a third stage where multinationality has exceeded its optimal level and the increasing costs of coordinating and controlling a geographically dispersed network of value chain activities more than offset the increasing benefits of multinationality. This S-shaped relationship has been empirically supported by Lu/Beamish (2004).

In the M-V-research the main focus up to now has been on analyzing the moderating effect of firm-specific intangible assets.

A concept which up to now has received only limited attention in the empirical research is the economies of scale-argument: Multinational firms may experience positive performance effects simply because the size of their product markets is larger compared with firms concentrating on their domestic market. Henceforth, MNCs should be able to realize economies of scale in higher terms than purely domestic firms. However, if economies of scale and market size prove to be empirically relevant, this implies that the performance effect of corporate multinationality should vary depending on the size of firms' home markets. From this viewpoint, the generalizability of academic insights generated from samples of US-firms appears questionable.

This paper aims to analyze the impact of multinationality on performance testing different theories regarding this relationship, more specifically the theory of intangible assets (sometimes reffered to as "internalization theory", e.g. Morck and Yeung, 1991, 1992), the industrial organization argument of economies of scale and the S-shaped approach based on the liabilities of foreignness-argument, the argument of complexity and theories of organizational learning. It is based on a sample of stock-listed companies from three Continental European countries, namely France, Germany and Italy. These three countries are the largest economies of the Continental European countries in the European Union. In terms of GDP, in 2008 they made up nearly half of the GDP of all countries of the European Union[i].

For different samples ranging between 1061 to 2663 firm-year-observations, we use an accounting based measure (return on assets) as well as a market value-based variable (Tobin's Q) as indicators for performance for the period from 1990 to 2006. Contrary, to previous research we find an inverted S-shaped relationship between multinationality and performance, which nevertheless supports the idea of a non-linear relationship between multinationality and performance based on costs of internationalization and organizational learning. However, the S-shaped effect is attenuated by the performance effects that intangible assets and potentials for economies of scale unfold in the course of internationalization. Furthermore, by differentiating between different types of firms we are able to provide empirical support for the con-

jecture, that there is no such thing as a general M-P-relationship, but that the kind of relationship differs between different kinds of firms and depends to a large extent on the amount of intangible assets related to R&D and on the potential to realize economies of scale through internationalization.

The paper is organized as follows. In the following section we will present a review on theory and extant research findings. Afterwards, we describe the methodology employed and the sample on which our analysis is based. In the following section our empirical findings are presented and discussed. In the final section we summarize our findings and present a short outlook on future research.

2. LITERATURE REVIEW

With regard to explaining the relationship between multinationality and performance, different theoretical arguments are proposed in the literature. This plurality of theoretical arguments notwithstanding, many theorists base their line of argumentation on the assumption that corporate multinationality implies certain costs that a firm restraining itself to its domestic market might not incur. Such additional costs of multinationality may on the one hand arise from the liabilities of foreignness and newness (Hymer, 1976; Zaheer, 1995). Firms entering foreign markets may have to convince potential customers to choose them as new suppliers. These efforts cause costs which firms already “in the market” do not incur (at least not to the same extent). Furthermore, firms operating abroad are confronted with business environments, political and economic systems as well as cultural systems, which are different from the ones they are familiar with. These differences may lead to unexpected costs due to erroneous decisions, which are taken by managers not being (fully) aware of the specifics of the foreign market.

But, on the other hand, managers of a multinational company (MNC) may be able to learn from previous mistakes and may therefore be able to reduce the liabilities of foreignness and newness with increasing international experience (Zaheer & Mosakowski, 1997). Hence, the marginal costs resulting from the liabilities of foreignness may decrease with increasing multinationality.

However, increasing multinationality often goes hand in hand with an increasing geographical fragmentation of the value chain as well as with a multiplication of specific value chain activities of the MNC at different locations. In short, increasing multinationality implies increasing complexity (Lu & Beamish, 2004). This increasing complexity given, the marginal costs of coordinating and controlling an MNC may increase with increasing multinationality.

These difficulties given, it seems rather plausible to assume that multinationality can induce decreases in profitability which might be accompanied by corresponding decreases in value, or at least does not automatically imply increases in profitability and value. From this viewpoint, one might ask why firms pursue internationalization efforts at all. There may be three different explanations: First, decision makers may not be fully aware of the difficulties of multinationality and may underestimate the problems arising from it. Second, decision makers may pursue other goals than maximizing corporate performance. Third, the disadvantages of multinationality are more than offset by certain advantages which emanate from multinationality.

While the first explanation as a theoretical argument and especially as an empirical topic still lives in the shadows, the second explanation has been discussed and examined in international business research for decades. The fact that companies pursue internationalization despite the costs of going abroad, is explained by agency theory though the separation of ownership and control and the divergence of interests between shareholders and managers. Internationalization decisions may be driven more by the personal interests of managers than sound economic motives (Aharoni, 1966). Multinationality might often be more in the interests of management and bondholders than in the interest of shareholders. Growth, diversification, prestige or simply higher remuneration are the primary motives for internationalization according to this theory. And given the impact of multinationality on firm risk, it is not in the interest of shareholders.

On the other hand it is argued, that multinationality may imply certain advantages. One argument is that firms may be able to reduce the fluctuation of revenues (and hence the variance of profitability) by geographical diversification (Rugman 1976). The corresponding effects of a reduction in the variability of profitability on value are

however unclear. Following the incomplete capital markets theory (ICMT) multinational firms can be considered as a diversification vehicle for their investors. Investing in different countries might be difficult and costly for investors due to lack of information on foreign firms, certain regulations restricting transfer of capital across borders etc. By investing in a multinational firm investors reap the benefits of international diversification without having to diversify their capital across several countries. In this case multinational firms are in charge of a diversification advantage compared to their investors and hence, multinationality is viewed by investors as something valuable (Errunza & Senbet, 1981, 1984). However, if capital markets are sufficiently integrated, investors may be able to realize the benefits of international diversification by themselves. Under these conditions, firm diversification bears no value for investors. In a similar way, proponents of the contingent claims hypothesis argue, that the risk reduction effect of international diversification leads to a wealth transfer from stockholders to bondholders (Doukas & Kan, 2006).

According to location theory, multinational firms are able to combine and exploit the advantages of different locations. On the one hand MNCs may be able to utilize differences in prices and qualities on the various national product, factor, and capital markets (Kogut, 1985). On the other hand, due to the multiplication of value chain activities, MNCs may be able to react more flexibly to changes in their business environments than their purely domestic competitors. Operating in a multitude of countries simultaneously, a multinational network has a lot more real options compared with a purely domestic firm. Furthermore, the MNC can absorp inputs from a variety of different locations. These inputs may foster innovation processes inside the MNC. These advantages may contribute to a higher profitability and if investors appreciate them, they might induce a higher value for MNCs compared with purely domestic companies.

The proponents of the theory of intangible assets (sometimes referred to as “internalization theory”) argue, that multinationality increases performance, if the multinational firm is in charge of certain firm-specific intangible assets, which should be internally exploited and capitalized on foreign markets. These firm-specific intangible assets enable these MNCs to compete successfully against national competitors, who are not burdened with liabilities of foreignness (Caves, 1971; Hymer, 1976;

Morck & Yeung, 1991). Even if these intangible assets may not be a sufficient condition for guaranteeing superior rents (Hennart, 2007), according to the intangible asset theory they are a necessary one. Therefore, following this theory, without intangible assets multinationality does not lead to an improvement of profitability and a corresponding increase in value.

Moreover, MNCs may utilize economies of scale which firms operating in only one country may not be able to realize due to the limited size of their home market. Depending on the size of the home market, multinationality may therefore contribute to increases in profitability and value (Hennart, 2007).

The combination of different theoretical arguments leads to different theoretical assumptions about the kind of relationship between multinationality and performance. Whereas some researchers argue that the relationship between multinationality and performance is linear, others argue that it is U-shaped or inverted-U-shaped. A more recent contribution to the academic discussion on the relationship between multinationality and performance is offered by the organizational learning perspective (Ghoshal & Bartlett, 1990; Barkema & Vermeulen, 1998; Vermeulen & Barkema, 2002). According to this theory, the M-P-relationship is S-shaped. In a first stage of the internationalization process MNCs are challenged by new cultural and institutional settings. Confronted with the new environment of a foreign market, the company has to adapt its structures, strategies, systems as well as its corporate culture to a certain extent to compete successfully against established competitors in the foreign market. In this stage increasing multinationality leads to decreases in performance due to the liabilities of foreignness. In a second stage of internationalization, the MNC has accumulated sufficient knowledge regarding operating in foreign markets and managing a multinational network of operations and should therefore be able to reap these benefits of being a multinational. Therefore, during this stage increasing multinationality leads to increasing corporate corporate performance. But, from a certain threshold of internationalization on, increasing multinationality might imply too much complexity so that the costs of operating in many countries exceed the benefits and increasing multinationality is accompanied by decrasing performance from there on. Taken together, these arguments propose a S-shaped relationship between multinationality and performance (Contractor, 2007; Lu & Beamish, 2004). An important im-

plication of the S-curve-theory is the implicit assumption that there exists an optimal degree of multinationality.

Although, in the meantime researchers have presented comprehensive overviews on the state of the art regarding the empirical validation of the different theoretical arguments concerning the M-P-relationship (Annavarjula & Beldona, 2000; Bausch & Krist, 2007; Ramaswamy, 1992), we will briefly sketch the main findings of extant research.

Unfortunately, the empirical evidence regarding the impact of multinationality on performance appears to be rather unconclusive. A number of studies supports the liabilities of foreignness and newness argument. Geringer et al. (2000) find that multinationality has a negative impact on return on sales. Click and Harrison (2000) find a negative valuation impact of multinationality on Tobin's Q in the range of 8.6 to 17.1 percent. This finding is supported by the results of Denis et al. (2002). Following Mishra and Gobeli (1998), Click and Harrison (2000) or Doukas and Kan (2006) the negative impact of multinationality on performance might be due to agency problems.

Regarding the risk reducing effect of corporate multinationality different empirical studies were undertaken generating insonsistent results. E.g. Kim et al. (1993) showed that multinationality leads to decreases in the variability of corporate profitability. Agmon and Lessard (1977) claim to have found evidence that MNCs are approriate vehicles for realizing the benefits of international diversification. Their argumentation was, however, heavily critized by Adler (1981). Jacquillat and Solnik (1978) showed that international portfolio diversification was more efficient than international corporate diversification by foreign direct investment. Errunza and Senbet (1981, 1984) compare the impact of multinationality on value during two different periods: one characterized by severe restrictions concerning international capital transfers, the other characterized by more liberal regulations, thus testing the incomplete capital markets theory (ICMT). The authors find that multinationality increases value, albeit the effect on value weakens due to the increasing liberalization of international capital markets. Hence, the authors appear to have found empirical evidence on the validity of the ICMT. This theory is again tested by Morck and Yeung (1991), who interpret their findings as a proof that capital markets are sufficiently integrated, so

that corporate multinationality is not a value in itself. A number of contributions from Markides and Ittner (1994), Markides and Oyon (1998), Christophe (1997), Mishra and Gobeli (1998) support this argument. Nevertheless in a recent study Gande, Schenzler & Senbet (2009) claim to have found empirical evidence on the ICMT. However, a closer look at these studies reveals that their ability to test the validity of the incomplete capital markets theory must be considered as dubious due to methodological problems (Eckert & Engelhard, 2008).

Furthermore, researchers have analyzed whether the valuation impact of multinationality depends on the existence of firm-specific intangible assets. In the relevant studies concerning this question research and development spending is usually employed as a measure of firm specific intangible assets related to research and development (R&D) and advertising expenditures are used as a proxy for firm-specific intangible assets related to marketing skills and consumer goodwill (Kotabe, Srinivasan & Aulakh, 2002). Already in 1974 Severn and Laurence (1974) claim to have found supporting evidence that firm specific resources related to R&D have a positive impact on the relationship between multinationality and profitability. The findings of Delios and Beamish (1999) also support this view. Morck and Yeung (1991) can be seen as the pioneering contribution regarding the question whether intangible assets are a prerequisite for a positive effect of multinationality on firm value. The essence of their empirical results is that the existence of firm-specific intangible assets is crucial if internationalization is expected to create value. Markides and Ittner (1994), Markides and Oyon (1998), Christophe (1997) and Mishra and Gobeli (1998), who adopt the research design of Morck and Yeung to some extent, find supporting evidence.

Additionally, arguments from industrial organization theory are used in order to explain the relationship between multinationality and value. Economies of scale may provide a theoretical reason why expanding abroad may improve firm performance. Eckert et al. (2008) claim to have found empirical support, that multinationality leads to value increases if the MNC has the potential to reap economies of scale.

Moreover, Morck and Yeung (1991) analyze whether the potential to combine the location advantages of different locations adds value. The authors test, whether sub-

sidiaries located in low cost countries or subsidiaries located in tax havens lead to an enhancement of value. Based on their empirical findings, they come to the following conclusion:

„Our results do not support … theories of the advantages of multinationality based either on tax avoidance using transfer pricing, tax havens, and so on, or on the use of cheaper labor or other production inputs in low cost countries.“(Morck & Yeung, 1991, p. 185).

Markides and Ittner (1994) resp. Markides and Oyon (1998) who concentrate on the impact of the announcement of foreign acquisitions on the stock price of the acquiring firm, examine the moderating effect of location advantages, however without being able to deliver significant results. On the other hand, a number of other event studies, which analyze the effect of a foreign acquisition on the share price of the acquirer, find that acquisitions from developing countries lead to significantly higher share price reactions (Doukas & Travlos, 1988; Doukas, 1995; Kiymaz, 2004; Doukas& Kan, 2006): a finding that is perfectly in line with the assumption that multinationality increases value due to the fact that multinational firms are able to combine the location advantages of different locations. This assumption is further supported by Pantzalis (2001) and Berry (2006), who come to the conclusion that having the ability to combine the advantages of different locations increases value, albeit only under certain conditions.

Furthermore, various researchers have empirically explored the flexibility-argument. In most cases, the breadth of multinational network (which is measured by the number of countries, in which the MNC operates) has a positive impact on value (Allen & Pantzalis, 1996; Antia et al., 2007; Lee & Makija, 2009) supporting the assumption that MNCs benefit from being in charge of a higher amount of real options.

The idea that the relationship between multinationality and performance is non-linear has a rather long-tradition in the research field where the focus is on the effect of multinationality on accounting-based performance (M-ABP-research). Haar (1989), Geringer et al. (1989), Hitt et al. (1997) find evidence that the positive effect of multinationality on profitability is thwarted by increasing costs of complexity when the de-

gree of corporate multinationality exceeds a certain threshold. More recent studies claim to have found empirical evidence supporting an S-shaped relationship between multinationality and performance (Contractor, Kundu & Hsu, 2003; Lu & Beamish, 2004; Ruigrok, Amann & Wagner, 2007).

Yet, despite the ongoing discussion on the nature of the relationship between multinationality and accounting-based performance, in the research field where the focus was on the impact of multinationality on value (M-V-research) linear approaches dominate. Up to now, studies analyzing a non-linear effect of multinationality on firm value are rare. One of the very few exceptions is Lu and Beamish (2004), who find evidence that the S-curve also holds with regard to Tobin's Q.

A further difference between the two research traditions is that while the studies from the M-V-research domain almost always rely on samples consisting exclusively or almost exclusively of US-firms. Research from other countries is rather rare. One of the few exceptions is again the contribution of Lu and Beamish (2004). On the contrary, concerning the M-ABP-studies, the country of origin of the firms analyzed is more mixed (for an overview see Bausch & Krist, 2007).

Summarizing extant research it might be justified to state that one of the main contributions of M-V-research has been to highlight the role of intangible assets, while the main contribution of M-ABP-research has been to prove the impact organizational learning exerts on the relationship between multinationality and performance. Following Lu and Beamish (2004) we try to synthesize these contributions by analyzing the effect of organizational learning, intangible assets and potentials for economies of scale on the M-P-relationship simultaneously and replicate their study of Japanese firms by analyzing a sample of firms from Continental Europe. By concentrating on a sample of companies from European countries, not only the transferability of the findings from Lu and Beamish (2004) is tested, but furthermore the generalizability of knowledge on the relationship between multinationality and value generated from US-samples. We may therefore be able to enrich extant knowledge concerning the relationship between multinationality and value, as this stream of research has been relying heaviliy on US-samples up to now. Additionally, by analysing the effect that potentials for economies of scale exert on the relationship between multinationality

and performance, we may contribute to an increase in insight regarding the relationship between multinationality and performance as the moderating effect of potentials for economies of scale has not been considered sufficiently in extant research up to now.

3. SAMPLE AND METHODOLOGY

Referring to Click and Harrison (2000), Christophe (1997), Mishra and Gobeli (1998), Morck and Yeung (1991) we use Tobin's Q as a value-based indicator of corporate performance. Tobin's Q is defined as the market value of the firm divided by the replacement costs of its tangible assets (Tobin, 1969). We obtain estimates for a firm's Tobin's Q by the following formula:

$$Q = \frac{Market\,Value\,of\;Equity + Market\,Value\,of\;Preferred\;Stock + Book\,Value\,of\;Debt}{Book\,Value\,of\;Equity + Book\,Value\,of\;Preferred\;Stock + Book\,Value\,of\;Debt}$$

However, in contrast to Morck and Yeung (1991), Mishra and Gobeli (1998) and others we argue, that due to its operationalization Q can not be interpreted as a proxy for firm value, but has to be interpreted as a proxy for shareholder value (Eckert et al., 2008). Furthermore, we use return on assets (ROA) as a measure of accounting based performance.

Multinationality was measured employing the ratio of foreign sales to total sales (FSTS) and the ratio of foreign assets to total assets (FATA).

As control variables we considered leverage, profitability, size, industry, industrial diversification, capital intensity, and firm-specific intangible assets. Leverage was measured by the ratio of total debt to total assets (TDTA). Leverage has been employed as a control variable by Christophe (1997), Click and Harrison (2000), Denis et al. (2002), Lu and Beamish (2004) Mishra and Gobeli (1998), Morck and Yeung (1991) among others. In most of these studies a significant negative relationsship

between leverage and performance was found. As a proxy for size we used total assets (TA). Concerning the effect of firm size extant research reports contradictory results (Bodnar et al., 2003; Click & Harrison, 2000; Christophe, 1997; Kotabe, Srinivasan & Aulakh, 2002; Lu and Beamish, 2004).

We took account of a firm's industry by employing industry dummies (Click & Harrison, 2000; Morck & Yeung, 1991). Furthermore, we control for the degree of industrial diversification by classifying firm activities according to the Standard Industrial Classification-Code (SIC). Firms were considered as industrially diversified if they had more than one business segment at the 2-digit standard industrial classification (SIC) code level. Besides a few exceptions (e.g. Kim, Hwang & Burgers, 1993) most studies find a negative effect of industrial diversification on performance (Bodnar et al., 2003; Lu and Beamish, 2004).

Additionally, Bodnar et al. (1997) and Denis et al. (2002) take account of a firm's capital intensity. We interpret capital intensity as a proxy for potentials for economies of scale (George et al., 1992). This control variable is measured by capital expenditures per sales (CETS). Bodnar et al. (1997) as well as Denis et al. (2002) find a significant positive relationship between capital expenditures per sales and shareholder value.

Furthermore, several control variables were included in order to proxy for a firm's intangible assets. To measure firm-specific intangible assets related to R&D we use the variable research and development per sales (RDS). A significant positive effect of this variable on performance has been confirmed by the studies of Bausch and Krist (2007), Bodnar et al. (1997), Christophe (1997), Denis et al. (2002), Markides and Oyon (1998), Mishra and Gobeli (1998). Firm-specific intangible assets related to marketing capabilities and consumer goodwill were considered by Bodnar et al. (1997), Christophe (1997), Denis et al. (2002), Kotabe et al. (2002), Markides and Ittner (1994), Markides and Oyon (1998) among others. Due to lack of data, we could not use advertising expenses as a control variable in our model. Instead, we em-

ployed the variable selling, general and administrative expenses per sales (SAS) in order to measure firm-specific intangible assets related to marketing capabilities and consumer goodwill as well as specific organizational and managerial skills.

Moreover, in some studies, where the impact of multinationality on value was analyzed profitability was introduced as a control variable. Referring to Bodnar et al. (1997) and Denis et al. (2002) who discovered a significant positive relationship between profitability and value, we included profitability as a control variable in our value-based regression model (i.e. with Tobin's Q as dependent variable) measuring profitability by the ratio of EBIT per sales.

In Table 1 an overview on the variables employed in this study is given.

Insert Table 1 about here

Our sample consists of listed corporations from France, Germany and Italy from all industrial sectors except financials. As the period of analysis we select the time interval stretching from 1990 to 2006. Capital market data were obtained from Thomson Financial Datastream, accounting data were retrieved from Worldscope. We included all corporations from France, Germany and Italy which were listed at least for one year for our period of analysis and provide all necessary informations for the variables employed in our models. Thus, we reached a minimum total number of firm-year-observations of 1,056 (Models 7-12) and a maximum of 2,654 firm-year-observations (Models 13-28). Models where multinationality is proxied by foreign sales to total sales have in general a better coverage due to improved data availability for this indicator.

4. EMPIRICAL RESULTS

4.1 Descriptive Statistics

Table 2, 3, 4, 5 and 6 offers summary statistics and bivariate correlation matrixes for all four groups of samples.

Insert Table 2, 3, 4, 5 and 6 about here

The samples are dominated by German firm-year-observations, especially when foreign assets to total assets are used as a proxy for multinationality. Firm-year-observations from Italy only amount to a relatively small percentage of the respective samples, but their share increases when the foreign sales ratio is used as a proxy for multinationality. With regard to the distribution of firm-year observations across industries the sample is dominated by firm year observations of the sectors industrials, consumer goods and technology, which constitute together approximately two thirds of all observations in the different samples.

Depending on the respective sample group an average firm has a return on assets of between 1.2 to 1.9 percent or respectively an average lnTQ of 0.38 to 0.39. The average ratio of foreign sales to total sales ranges between 53.4 to 53.8 percent and the average foreign assets ratio ranges between 34.1 to 34.5 percent. Furthermore, companies spend on average 5.9 to 8.1 percent of their sales for capital investment, 24.4 to 25.8 percent of their sales for selling and general administrative expenditures and 7.8 to 9.7 percent of their sales for research and development. The average ratio of debt to total assets amounts to between 19.1 and 20.5 percent. Between 58.7 to 61.9 percent of the firm-year-observations are industrially diversified.

4.2 Multivariate Analysis

In order to gain insight on the impact of multinationality on performance, we tested several different regression models. Our baseline models were:

M1 and M13:

$$ROA = Const. + \beta_1 \times MN + \beta_2 \times RDS + \beta_3 \times SAS + \beta_4 \times CETS + \beta_5 \times TDTA + \beta_6 \times LnTA + \beta_7 \times DummyISeg + \varepsilon$$

M7 and M19:

$$LnQ = Const. + \beta_1 \times MN + \beta_2 \times RDS + \beta_3 \times SAS + \beta_4 \times CETS + \beta_5 \times TDTA + \beta_6 \times LnTA + \beta_7 \times EBITS + \beta_8 \times DummyISeg + \varepsilon$$

Subsequently, we included a squared and a cubic component of multinationality in further regression models in order to test non-linear effects of multinationality on performance. The models with the squared component are specified as the following:

M3 and M15:

$$ROA = Const. + \beta_1 \times MN + \beta_2 \times MN^2 + \beta_3 \times RDS + \beta_4 \times SAS + \beta_5 \times CETS + \beta_6 \times TDTA + \beta_7 \times LnTA + \beta_8 \times DummyISeg + \varepsilon$$

M9 and M21:

$$LnQ = Const. + \beta_1 \times MN + \beta_2 \times MN^2 + \beta_3 \times RDS + \beta_4 \times SAS + \beta_5 \times CETS + \beta_6 \times TDTA + \beta_7 \times LnTA + \beta_8 \times EBITS + \beta_9 \times DummyISeg + \varepsilon$$

Furthermore, the models including a cubic component are specified as follows:

M5 and M17:

$$ROA = Const. + \beta_1 \times MN + \beta_2 \times MN^2 + \beta_3 \times MN^3 + \beta_4 \times RDS + \beta_5 \times SAS + \beta_6 \times CETS + \beta_7 \times TDTA + \beta_8 \times LnTA + \beta_9 \times DummyISeg + \varepsilon$$

M11 and M23:

$$LnQ = Const. + \beta_1 \times MN + \beta_2 \times MN^2 + \beta_2 \times MN^3 + \beta_4 \times RDS + \beta_5 \times SAS + \beta_6 \times CETS + \beta_7 \times TDTA + \beta_8 \times LnTA + \beta_9 \times EBITS + \beta_{10} \times DummyISeg + \varepsilon$$

In each model we controlled for industry effects using industry dummies. Furthermore, year dummies were included in order to control for macroeconomic effects. We also checked country-specific effects by additionally including country-dummies. However, inclusion of these dummies did not substantially alter our results. Then, following Eckert et al. (2008), Kotabe et al. (2002), Morck and Yeung (1991), Mishra and Gobeli (1998), we introduced interaction terms measuring the moderating impact of intangible assets and potentials for economies of scale on the multinationality-performance relationship.

Insert Table 7 and 8 about here

We estimate ordinary least squares (OLS) regressions with heteroskedasticity and autocorrelation robust Newey-West standard estimates (Newey, West, 1987). The results are presented in tables 7 and 8. In correspondence to previous studies leverage has a significant negative effect on ROA as well as on Tobin's Q. Size is measured by the natural log of total assets and has a significant positive effect on ROA, but a significant negative effect on Tobin's Q. The ratio of selling, general and administrative expenses per sales has a significant negative effect on ROA, but a positive effect on Tobin's Q. The effect of research and development per sales is the same for ROA and similar for Tobin's Q. This finding could be interpreted in a way that current spendings for R&D and marketing lead to a reduction in current return on assets (Lu & Beamish, 2004), but are interpreted by investors as an investment in the future and therefore lead to value increases as current value may be interpreted as investors' anticipation of the firm's future profitability. Capital expenditures per sales exert a significant positive effect on ROA in the model where FSTS is used as indicator of

multinationality, but have no effect on ROA in the model where FATA is used. Their effect on Tobin's Q is positive and in some models weakly significant. The regression coefficient of industrial diversification is negative, but not significant for Tobin's Q. However, when ROA is used as performance indicator, we find a significantly negative impact of industrial diversification throughout the different models.

Overall, the adjusted R-squares of our models seem to be quite satisfactory, ranging from 0.111 to 0.346. Consistent with the findings of Christophe and Lee (2005) and Eckert et al. (2008) we find that FATA leads to more efficient performance explanations than FSTS. Substituting FSTS by FATA increases adjusted R-squared in the worst case by more than 8 percentage points and in most cases by more than 11 percentage points. With the exception of the linear model with ROA as dependent variable (M13), FSTS never comes out significant. In contrast to this, FATA is significantly positive in the linear models explaining ROA and Tobin's Q (M1 and M7).

The introduction of a squared component of multinationality wipes out the significance of the regression coefficients of multinationality (M3, M9, M15, M21). However, introducing a third, cubic component of multinationality changes the results remarkably at least if FATA is employed as proxy for multinationality. All components of multinationality are significant, in the case of ROA even at the 0.001 level. While the linear component of FATA and the cubic component both have a positive sign, the squared comes out negative. Thus, our findings support the S-shaped relationship between multinationality and performance. However, contrary to the findings of Lu and Beamish (2004), who support the conventional S-shaped argumentation for a sample of Japanese companies, we find an inverted-S-curve: In a first stage multinationality leads to increases in profitability and value. Then, afterwards in a second stage, with increasing multinationality, profitability and value decline until after a certain threshold of internationalization has passed, profitability and value rise again. These findings are perfectly in line with the results of Ruigrok et al. (2007) who find a "sinus curve (or Swiss landscape form)" (p. 361)–relationship between multinationality and performance in the case of MNCs from Switzerland. These empirical contra-

dictions notwithstanding, we interprete our results as empirical support for the relevance of organizational learning for the impact of multinationality on performance. European firms often start internationalization by investing in neighbour-countries with little cultural distance to the home country. These first steps in being a multinational seem to be relatively easy to handle, especially for European MNCs given the close economic and political integration of most European countries. Therefore, negative performance effects of multinationality may not dominate until multinationality has reached a further stage, where the firm is present in a number of countries, some of them with a higher cultural distance. It is at this stage, that European MNCs seem to have to go trough painful processes of learning how to manage their multinational networks and how to exploit the knowledge accumulated in their subsidiaries located in different countries. Yet, after having passed this stage, armed with the capabilities to manage their multinational networks and to exploit the advantages of being a multinational, further multinationality appears to be beneficial for European MNCs.

In order to simultaneously capture the moderating effects of intangible assets and economies of scale on the relationship between multinationality and performance, we introduced three interaction variables into our models, namely multinationality x capital expenditures per sales, multinationality x research and development spending per sales and multinationality x selling, general and administrative expenses per sales.

More specifically:

M2 and M14:

$$ROA = Const. + \beta_1 \times MN + \beta_2 \times RDS + \beta_3 \times SAS + \beta_4 \times CETS + \beta_5 \times TDTA + \beta_6 \times LnTA + \beta_7 \times DummyISeg + \beta_8 \times MN \times CETS + \beta_9 \times MN \times SAS + \beta_{10} \times MN \times RDS + \varepsilon$$

M8 and M20:

$$LnQ = Const. + \beta_1 \times MN + \beta_2 \times RDS + \beta_3 \times SAS + \beta_4 \times CETS + \beta_5 \times TDTA + \beta_6 \times LnTA + \beta_7 \times EBITS + \beta_8 \times DummyISeg + \beta_9 \times MN \times CETS + \beta_{10} \times MN \times SAS + \beta_{11} \times MN \times RDS + \varepsilon$$

M4 and M16:

$$ROA = Const. + \beta_1 \times MN + \beta_2 \times MN^2 + \beta_3 \times RDS + \beta_4 \times SAS + \beta_5 \times CETS + \beta_6 \times TDTA + \beta_7 \times LnTA + \beta_8 \times DummyISeg + \beta_9 \times MN \times CETS + \beta_{10} \times MN \times SAS + \beta_{11} \times MN \times RDS + \varepsilon$$

M10 and M22:

$$LnQ = Const. + \beta_1 \times MN + \beta_2 \times MN^2 + \beta_3 \times RDS + \beta_4 \times SAS + \beta_5 \times CETS + \beta_6 \times TDTA + \beta_7 \times LnTA + \beta_8 \times EBITS + \beta_9 \times DummyISeg + \beta_{10} \times MN \times CETS + \beta_{11} \times MN \times SAS + \beta_{12} \times MN \times RDS + \varepsilon$$

M6 and M18:

$$ROA = Const. + \beta_1 \times MN + \beta_2 \times MN^2 + \beta_3 \times MN^3 + \beta_4 \times RDS + \beta_5 \times SAS + \beta_6 \times CETS + \beta_7 \times TDTA + \beta_8 \times LnTA + \beta_9 \times DummyISeg + \beta_{10} \times MN \times CETS + \beta_{11} \times MN \times SAS + \beta_{12} \times MN \times RDS + \varepsilon$$

M12 and M24:

$$LnQ = Const. + \beta_1 \times MN + \beta_2 \times MN^2 + \beta_2 \times MN^3 + \beta_4 \times RDS + \beta_5 \times SAS + \beta_6 \times CETS + \beta_7 \times TDTA + \beta_8 \times LnTA + \beta_9 \times EBITS + \beta_{10} \times DummyISeg + \beta_{11} \times MN \times CETS + \beta_{12} \times MN \times SAS + \beta_{13} \times MN \times RDS + \varepsilon$$

The first of these interaction terms is used to test whether the effect of multinationality on performance depends on the potential to realize economies of scale through multinationality, the second and the third are used to test whether the impact of multinationality on performance depends on intangible assets related to R&D, rsp. to marketing and management. [We also included an additional interaction term composed of multinationality and leverage in our model for Tobin's Q in order to test the contingent-claims-hypothesis (Doukas & Kan 2006). This term did not prove to be significant, nor did it lead to substantial changes regarding the significance of other regression coefficients or the explanatory power of the respective models. Therefore we excluded this term from the models reported here].

Concerning ROA the interaction term of multinationality and capital expenditures per sales is negative and weakly significant, no matter what proxy we use for multinationality. If we refer to Tobin's Q as the dependent variable, the interaction term of

multinationality and capital expenditures per sales is not significant for FSTS, but for FATA it is positive and significant at the one-percent-level. Referring again to the FATA-model, we might conclude that the internationalization of capital intensive firms at first leads to a decrease in profitability, but that investors consider multinationality as a valuable strategy for (European) MNCs if they are in charge of potentials for economies of scale and if multinationality is accompanied by foreign direct investment (FDI).

Concerning the interaction term of multinationality and selling, general and administrative expenses per sales our findings are not as clear as regarding multinationality's interaction with capital expenditures. If we proxy multinationality by FSTS, we find a significantly positive effect on ROA, but a significantly negative effect on Tobin's Q. Using FATA as indicator of multinationality, we also find a significant positive effect on ROA, but no effect on Tobin's Q. Our findings regarding this are contrary to Kotabe et al. (2002) who uncover a negative influence of the interaction term of multinationality measured by the ratio of foreign income to total income and marketing capabilities on ROA. Intangible assets related to marketing and management appear to have a positive effect on accounting-based performance, but not on value.

On the contrary, for the interaction term of multinationality and research and development spending per sales we find no significant effect on ROA if FATA is used as proxy for multinationality, but a significant positive impact on Tobin's Q. If FSTS is used as indicator of multinationality, the effect on ROA is significantly negative with no significant effect on Tobin's Q. We conclude that investors perceive multinationality to be a valuable strategy especially if the multinational firm is in charge of intangible assets related to R&D and if multinationality is accompanied by FDI.

However, most remarkably seems to be the fact that the introduction of the interaction terms reduces the direct effect of multinationality on performance throughout the different models employed. When considering ROA, the significance of the various coefficients of multinationality (linear, squared and cubic) is attenuated. In the case of

Tobin's Q the S-shaped effect totally disappears. We may interprete this in a way that the effect of organizational learning is dominated by intangible assets related to R&D and/or potentials for economies of scale. Even though firms may be able to gain necessary skills and competences during the process of internationalization, without a sufficient resource base multinationality can not become a valuable strategy from the viewpoint of investors.

4.3 R&D-intensive Firms vs. Less-R&D-intensive Firms

Due to the attenuating effect that the introduction of the interaction variables exerts on the M-P-relationship, we decided to partition our sample into subgroups: First, we split up our sample into two subgroups: one consisting of those firms (or specifically those firm-year-observations) which exhibit high percentages of R&D/sales (R&D-intensive firms), and the other consisting of firms (or specifically those firm-year-observations) which exhibit low percentages of R&D/sales (less-R&D-intensive firms). We split up our sample at the median value of R&D/sales and estimated the same regression models, which were employed for the total sample. We estimated regression coefficients using OLS with heteroskedasticity and autocorrelation robust Newey-West standard estimates (Newey, West, 1987). Regression estimates are summarized in tables 11, 12, 13 and 14. Descriptive statistics for both subgroups are presented in tables 9 and 10.

Insert Table 9, 10, 11, 12, 13, 14 about here

Concerning the subsample of less-R&D-intensive firms, our results can be summarized as follows: When performance is measured by ROA and multinationality by FATA, interaction terms are never significant. Using FSTS, the interaction term of multinationality with capital expenditures per sales comes out significantly negative. The interaction term of FSTS and SAS is positive and significant.

Furthermore, using FATA as indicator of multinationality, we find a U-shaped relationship between multinationality and performance (ROA). However, the regression coefficients of FATA and FATA squared indicate that – although multinationality leads to an improvement of ROA after a certain threshold of multinationality is passed – these increases do not offset the performance reductions that happened before passing that threshold. On the other hand, using FSTS as indicator of multinationality, we find an inverted-S-shaped-relationship. The regression coefficients of the inverted-S-shaped slope indicate that low levels of foreign sales may lead to increases in ROA, but that after a certain threshold the positive impact of multinationality on ROA reduces more and more until it is completely offset. Not until a very high percentage of foreign sales is reached does multinationality again lead to positive effects on ROA.

When employing Tobin's Q as performance measure, all interaction terms are insignificant. In the case of less R&D intensive firms there seems to be no systematic relationship between intangible assets either related to R&D or to marketing and management or potentials for economies of scale, multinationality and performance (measured by Tobin's Q). We find no non-linear relationship between multinationality and Tobin's Q. Multinationality in isolated terms is only significant in the linear regression model and has a negative effect on performance, regardless whether FATA or FSTS is used as an indicator of multinationality.

In sum, we interpret our results regarding less R&D-intensive firms as empirical support, that multinationality without a sufficient amount of intangible assets related to R&D is considered in most cases as a liability by the capital market. For less R&D intensive firms, multinationality obviously leads to decreases in capital market-performance. Nevertheless, we find an inverted-S-shaped effect of FSTS on ROA, implying that increasing foreign sales will – with the exception of a certain interval of multinationality in between – lead to positive effects on profitability.

With regard to the subsample of R&D-intensive firms, we find that using FATA as indicator of multinationality leads to much higher R-squared compared to using FSTS throughout the different regression models and irrespective of whether performance is measured by ROA or by Tobin's Q. FATA seems to be of special importance in explaining the performance effect of multinationality for R&D-intensive firms.

Concerning ROA as performance measure and FATA as a proxy for multinationality, we find a significant positive effect of the interaction between multinationality and intangible assets related to marketing and management. If we instead employ FSTS as a measure for multinationality, the interaction terms of SAS with multinationality and CETS with multinationality are insignificant, whereas the interaction term of RDS with multinationality is significantly negative.

Regardless whether FATA or FSTS is used as proxy for multinationality we find an inverted-S-shaped relationship between multinationality and ROA.

When Tobin's Q is used as measure of performance and FATA as proxy for multinationality, we find on the one hand a significantly positive effect of multinationality on Tobin's Q in the linear regression model (see Table 13, M7). However, the direct effect of multinationality vanishes when the interaction terms are introduced (M8). Wheras the interaction between FATA and SAS as well as FATA and CETS are not significant, the interaction between multinationality and R&D comes out significantly positive and hence can be interpreted as further empirical support for the intangible assets theory. For R&D-intensive firms the positive performance effect of foreign assets obviously is the higher, the higher the amount of intangible assets related to R&D.

The relationship between FSTS and Tobin's Q seems to be linear positive. Using FSTS we find neither empirical evidence for a non-linear relationship, nor do we find significance regarding the interaction terms: For R&D-intensive firms increasing foreign sales leads to positive effects on Tobin's Q irrespctive of the amount of intangible assets related to R&D: This means that once R&D-intensive firms have reached a

certain level of intangible assets to R&D, increasing foreign sales proves to be beneficial.

Summarizing our findings regarding R&D-intensive firms indicate that in the case of R&D intensive firms multinationality tends to lead to increases in performance.

4.4 Capital-intensive Firms vs. Less-capital-intensive Firms

Next, we partition our sample into two subsamples at the median value of CETS, i.e. we differentiate between capital intensive and less-capital intensive firms, assuming that capital intensive firms have a larger potential to realize economies of scale. Again, we estimated regression coefficients using OLS with heteroskedasticity and autocorrelation robust Newey-West standard estimates (Newey, West, 1987). Regression estimates are summarized in tables 17, 18, 19 and 20. Descriptive statistics for both subgroups are presented in tables 15 and 16.

Insert Table 15, 16, 17, 18, 19, 20 about here

If ROA is used as performance measure, the two subsamples are rather similar concerning the impact of multinationality on performance, especially if FATA is used as proxy for multinationality. Regardless whether capital intensive or less-capital intensive we find an inverted-S-shaped relationship between multinationality and performance which gets weaker (capital intensive firms) or even disappears (less capital intensive) when the interaction terms are introduced. Throughout the different models the interaction term SAS-FATA is significantly positive.

With regard to the interaction term SAS combined with multinationality similar results are obtained using FSTS as proxy for multinationality: the interaction term SAS-FSTS is significantly positive throughout the different models for capital intensive firms and less-capital intensive firms. However, using FSTS as proxy for multinationality the

inverted-S-curve can not be found for capital intensive firms. On the other hand, in the case of less-capital intensive firms the inverted-S-curve appears again, and is again weakened by the introduction of the interaction terms. In the case of less-capital intensive firms we find a significantly negative effect of CETS-FSTS on ROA, wheras we find a significantly negative effect of RDS-FSTS on ROA for capital intensive firms.

If Tobin's Q is used as measure of performance and FATA as proxy for multinationality, there seems to be no direct relationship between multinationality and performance for less-capital intensive firms. In the case of capital intensive firms, however, we find the inverted-S-curve, which is again weakened by the introduction of the interaction terms. Additionally, for this subsample we obtain a significantly positive effect of RDS-FATA and CETS-FATA on Tobin's Q. On the other hand, in the case of less-capital intensive firms, only RDS-FATA comes out significantly positive. As this result is accompanied by the insignificance of the isolated factors of multinationality, we may interpret this finding in a way that less-capital intensive firms need intangible assets related to R&D in order to increase performance through internationalization.

Finally, if FSTS is employed as proxy for multinationality and Tobin's Q as measure of performance we find no systematic relationship between multinationality and performance for capital intensive firms. In the case of less-capital intensive firms we also find no direct effect of multinationality on performance, but a significant positive effect of CETS-FSTS.

Summarizing, the results from partitioning our sample according to capital intensive and less-capital intensive firms indicate that in the case of the latter intangible assets related to R&D have a positive impact on the relationship between multinationality and shareholder value, if internationalization is accompanied by foreign direct investment, wheras increasing capital expenditures exerts a positive effect on the relationship between multinationality and shareholder value, if internationalization is accompanied by increasing foreign sales.

On the contrary, in the case of capital intensive firms shareholders only gain if internationalization is accompanied by FDI. The corresponding increase in shareholder value is the stronger, the higher the amount of intangible assets related to R&D and the higher the potentials for economies of scale.

4.5 SAS-high-firms vs. SAS-low-firms

Finally, we divide our sample according to the variable SAS into one group consisting of firms with a high amount of expenditures related to marketing and management (SAS-high-firms) and a second group consisting of firms with a relatively low amount of expenditures related to marketing and management (SAS-low-firms). We estimated regression coefficients using OLS with heteroskedasticity and autocorrelation robust Newey-West standard estimates (Newey, West, 1987). Descriptive statistics for both subgroups are presented in tables 21 and 22.

Insert Table 21, 22, 23, 24, 25, 26 about here

Concerning ROA as a measure of performance and using FSTS as proxy for multinationality, we find no systematic influence of multinationality on performance in the case of SAS-high-firms (The positive impact of FSTS in the linear model disappears after the introduction of the interaction terms). If we use FATA as proxy for multinationality, however, we obtain a negative impact of the isolated component of multinationality on ROA after the introduction of the interaction terms. This negative impact appears in the linear model as well as in the squared regression model: In fact, in the squared regression model a U-shaped relationship comes out significant, but the regression coefficients indicate that overall multinationality remains a liability. Nevertheless, the interaction term of SAS combined with multinationality is significantly positive for FATA as well as FSTS throughout the different regression models, indicating

that the effect of multinationality on ROA improves with an increasing amount of intangibles related to marketing and management for SAS-high-firms.

In the case of SAS-low-firms on the contrary, we find an inverted-S-shaped relationship, which holds even after implementing the interaction terms into the respective models, regardless whether FATA or FSTS is used as proxy for multinationality. We may interpret this finding in a way that in contrast to SAS-high-firms, SAS-low-firms are able to translate multinationality into positive positive ROA effects via processes of organizational learning. Additionally, in contrast to SAS-high-firms, for SAS-low-firms the interaction term of SAS combined with multinationality is insignificant irrespective of the proxy for multinationality: intangible assets related to marketing and management seem to support positive performance effects of multinationality only if those intangible assets exceed a certain threshold.

If performance is measured by Tobin's Q, FSTS seems to exert no systematic effect in the case of SAS-low firms. On the contrary, in the case of SAS-high firms there is a weak positive effect. If multinationality is proxied by FATA and performance is measured by Tobin's Q, the isolated component of multinationality is insignificant in most models and always insignificant after implementing the interaction terms for SAS-high-firms as well as for SAS-low-firms. Using instead FSTS as proxy for multinationality the interaction terms also never come out significant. We may interpret this as empirical support that expansion of foreign sales alone seems to be no value-increasing strategy for SAS-high as well as for SAS-low-firms. When using FATA as proxy for multinationality, however, RDS-FATA and CETS-FATA are positive and significant throughout the different regression models. However, SAS-FATA comes out insignificant. These results are valid for SAS-low-firms as well as for SAS-high-firms. Multinationality can be a value enhancing strategy if it is accompanied by foreign direct investment and the internationalizing firm is in charge of intangible assets related to R&D or in charge of potentials for economies of scale. On the other hand, intangible assets related to marketing and management do not seem to lead to increases in value.

5. DISCUSSION

Our findings highlight the relevance of intangible assets related to R&D and of potentials for economies of scale regarding the impact of multinationality on performance. Internationalizing firms should be in charge of certain prerequisites such as intangible assets related to R&D and/or potentials to realize economies of scale in order to generate performance increases through internationalization.

Furthermore, our findings indicate that the relationship between multinationality and performance is distinctly different for different groups of firms. The most distinct difference seems to be between R&D-intensive firms and less-R&D-intensive firms. For less-R&D-intensive firms intangible assets related to R&D or potentials for economies of scale obviously seem of minor importance. Their effect on the relationship between multinationality and performance is insignificant or negative. This is different regarding intangible assets related to marketing and management, which positively affect the relationship between the foreign sales ratio and ROA. Hence, in the case of less-R&D-intensive firms developing intangible assets related to marketing and management may prove a reasonable strategy to realize increases in ROA through the expansion of sales abroad. But, as the regression coefficients of the U-shaped relationship between FATA and ROA show, geographical expansion by FDI proves to have negative effect that is independent on the amount of intangible assets related to marketing and management. Although ROA recovers when FATA exceeds a certain level, it doesn’t reach the level of its starting point.

Moreover, as the inverted-S-shaped relationship between the foreign sales ratio and ROA indicates, less-R&D-intensive firms are able to realize positive effects on ROA from internationalization through processes of organizational learning. However, as our results with regard to Tobin’s Q indicate, the positive effect of foreign sales on profitability seems to be too weak to induce significant effects on shareholder value.

Our findings provide empirical support for the theory of intangible assets as especially in the case of R&D-intensive firms we find a positive relationship between multinationality and performance. For those firms, we find an inverted-S-shaped relationship between multinationality (measured either by FSTS or by FATA) and ROA which emphasizes the performance effect of processes of organizational learning. This overall positive relationship between multinationality and performance is confirmed by the results with regard to the influence of multinationality on shareholder value for R&D-intensive firms. For those firms we find a significantly linear positive effect of foreign sales on shareholder value as well as a significantly linear positive effect of foreign assets on shareholder value that is contingent on the amount of intangible assets related to R&D.

Wheras in the case of less-R&D-intensive firms there is a significant positive interaction effect of FSTS combined with intangible assets related to marketing and management on ROA and no significant interaction effect of FATA combined with SAS on ROA, in the case of R&D-intensive firms the results are the opposite: For R&D-intensive firms we find a significant positive effect of the interaction between FATA and SAS and no significant effect for FSTS and SAS indicating that for these different groups different internationalization strategies seem to be optimal. Nevertheless, these effects on profitability do not seem sufficient to induce significant effects on shareholder value.

In general, the capital market seems to appreciate the internationalization of R&D-intensive firms. On the one hand, this valuation effect of multinationality in the case of R&D-intensive firms seems to be directly dependent on the amount of intangible assets related to R&D. The higher the amount of intangible assets related to R&D, the stronger the positive performance effect of expanding abroad via foreign direct investment. On the other hand, contrary to less-R&D-intensive firms, in the case of R&D-intensive firms geographical expansion of sales beyond the border of the home country also has a positive effect on shareholder value regardless of the amount of intangibles related to R&D.

No other partition that we analyzed reveals such striking differences as the distinction between R&D-intensive firms and less-R&D-intensive firms. Whereas in the case of R&D-intensive firms multinationality seems to contribute to increases in performance, in the case of less-R&D-intensive firms multinationality has to be considered as a liability. In sum, we have to concede that while our model is quite appropriate for explaining the performance of R&D-intensive firms, its ability to predict the performance of less-R&D-intensive firms seems to be much weaker: R-squared is much lower for those models and most of the control variables do not come out significant, indicating that the performance mechanisms between R&D-intensive and less-R&D-intensive firms may be quite different and that there seems to be a knowledge gap concerning the relationship between multinationality and performance for less-R&D-intensive firms.

Furthermore, dividing our sample into capital-intensive firms and less-capital-intensive firms also reveals some interesting differences: Whereas in the case of capital-intensive firms we find an inverted-S-shaped relationship between FATA and ROA which is supported by a corresponding inverted-S-shaped relationship between FATA and Tobin's Q, we do not find empirical evidence of a systematic relationship between FATA and performance for the subsample of less-capital-intensive firms. However, for this subsample we find an inverted-S-shaped relationship between FSTS and ROA. These results indicate that for different types of firms different internationalization strategies are best suited for triggering processes of organizational learning and subsequent performance effects: capital-intensive firms should follow a different internationalization strategy compared with less-capital-intensive firms. Whereas capital-intensive firms seem to profit from geographically expanding by FDI, less-capital-intensive firms appear to be better off if they refrain from FDI and instead focus on expanding sales abroad. The higher capital expenditures are, the stronger is the positive effect of this strategy on shareholder value for less-capital-intensive firms. This interpretation about the performance effects of different internationalization strategies in the case of capital-intensive firms and less-capital-intensive firms is

further supported by the fact that in the case of capital-intensive firms the interaction term of CETS with FATA is significantly positive while the interaction term of CETS with FSTS is insignificant, whereas in the case of less-capital-intensive firms, the interaction of CETS and FSTS is significantly positive, while the interaction term of CETS with FATA is insignificant.

Finally, dividing our sample into firms with a high amount of intangible assets related to marketing and management (SAS-high firms) and firms with a low amount of intangible assets related to marketing and management (SAS-low firms) appears to be least instructive. Concerning the effect of multinationality on Tobin's Q there are no substantial differences between the two subsamples. However, there is a distinct difference regarding the effect of multinationality on ROA: Whereas in the case of SAS-intensive firms there seems to be no systematic direct effect of multinationality on ROA, in the case of less-SAS-intensive firms, we find an inverted-S-shaped relationship between multinationality (measured either by FATA or by FSTS) and ROA. This finding indicates that it might be easier transforming multinationality into positive performance effects when intangible assets related to marketing and management are small. This may be due to the fact that intangible assets related to marketing and management may be hard to transcend beyond the borders of the home country e.g. due to cultural differences concerning consumer preferences.

Overall our findings can be interpreted as empirical evidence that the theory of intangible assets holds not only for US-firms as extant research has proven, but also for European firms. The results may also be regarded as empirical support concerning the impact of the potential for economies of scale on the M-P-relationship. Our findings illustrate that the relationship between multinationality and performance may be different for different groups of firms and especially highlight the importance of differentiating according to R&D intensity and capital intensity. We are able to show that multinationality is good for R&D-intensive firms, but much less for less-R&D-intensive firms. We demonstrate that capital-intensive firms should expand geographically by FDI, while less-capital-intensive firms should refrain from FDI and (if internationalizing

at all) should focus on geographically expanding sales. Finally, we are able to support the assumption that the kind of relationship between multinationality and performance differs between different groups of firms. We provide empirical evidence of linear, squared and cubic kinds of relationships depending on the group of firm and the proxies for multinationality and performance. Future research should take this into account.

6. LIMITATIONS

As this paper is part of an ongoing research project, we have to concede that it may suffer from several limitations. First, the individual firm-year-observation data sets on MNCs from Continental European countries gained from our database are often uncomplete. Therefore, we experienced a severe loss of data problem, which might undermine the representativeness of our findings. Second, we measured Tobin's Q in the conventional way, common in contemporary M-V-research. In order to gain data on firm values in the corresponding studies the book value of debt is used as a proxy for its market value. Whether this proxy is adequate is an open debate (Doukas & Kan 2006, Glaser & /Müller 2009). The recent criticism concerning the use of the book value of debt as a proxy for its market value given, we think conventional operationalization of Tobin's Q should be more considered as an indicator of shareholder value than an indicator of market value. In this paper we consequently kept to this line of interpretation, although common research obviously has a different opinion with regard to that. Third, due to unsufficient data on the international structure of European MNCs we were not able to analyze in detail the effects of different geographical configurations of MNCs. Although the findings of Christophe and Pfeiffer (2002) raise serious doubts about the value relevance of geographical segment information, recent findings from Berry (2006) indicate the opposite. We think it would be worthwhile to analyze the effect of the geographical configuration in more detail. Fourth, our sample consists exclusively of listed firms from France, Germany and

Italy. However, listed firms represent only a small fraction of the economies of those countries. Our findings can therefore not be considered as representative for all kinds of MNCs from these countries. Fifth, we did not explicitly control for exchange rate changes. But, exchange rate changes may be captured by year dummies for the firm-year-observations which happen to be after the introduction of the Euro. Furthermore, given the fixed exchange rate regime, which had been installed before the introduction of the Euro, changes between the exchange rates of these countries before the introduction of the Euro should generally not induce severe effects. Nevertheless, we are planning to check this in a more advanced model.

7. CONCLUSION AND IMPLICATIONS FOR FURTHER RESEARCH

We analyzed the impact of multinationality on performance for a sample of firms stemming from Continental European countries, namely France, Germany, and Italy. By employing different measures of performance, namely ROA and Tobin's Q, and different proxies for multinationality, we tested several theories on the relationship between multinationality and performance.

In accordance with extant research we were able to provide empirical evidence on the relevance of intangible assets related to R&D and the potential for economies of scale for successful internationalization. Furthermore, we find empirical evidence for different kinds of relationships between different proxies for multinationality and different measures of performance. In the case of our sample, which is composed of listed firms from France, Germany and Italy, two kinds of relationships between multinationality and performance can be found: either a linear relationship or a non-linear relationship, which can be characterized as inverted-S-shaped. We find no empirical evidence for an S-shaped-relationship. Our findings therefore clearly indicate that (at least in the case of European MNCs) there exists no optimal degree of multinationality. These findings are in accordance with Ruigrok et al. (2007) for Swiss firms. We argue that our findings corroborate the conjecture of a country-of-orgin-effect influ-

encing the M-P-relationship. Our findings may therefore be interpreted as a plea to further analyse the cross-country generalizability opf the M-P-relationship. This seems especially important with regard to the M-V-research as up to now almost all research efforts in this field have been concentrated on MNCs from the US.

Furthermore, we are able to demonstrate that the relationship between multinationality and performance differs between different groups of firms. We are able to uncover distinct differences regarding the M-P-relationship between R&D-intensive firms and less-R&D-intensive firms as well as between capital intensive and less-capital intensive firms. In accordance with the theory of intangible assets as well as with industrial organization theory we find empirical evidence that firms with high amounts of intengible assets related to R&D and/or high potentials for economies of scale tend to benefit more from internationalization than firms without these prerequisites. For further research it seems recommendable to differentiate between R&D-intensive industries and less-R&D-intensive industries as well as between capital-intensive and less-capital-intensive industries as our results seem to indicate that there might be severe differences according to the multinationality-performance logic between these different groups of firms.

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[i] Due to significant differences between the corporate governance system of the UK and the corporate governance systems of France, Germany and Italy, which might bias our results, we excluded the UK from our analysis and concentrated our analysis on France, Germany and Italy as typical representatives of the Continental European group.

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Variable	**Abbreviation**
Tobin' s Q	TQ
Return On Assets	ROA
Foreign Assets / Total Assets	FATA
Foreign Sales / Total Sales	FSTS
Capital Expenditures / Net Sales or Revenues	CETS
Selling, General & Administrative Expenses / Sales	SAS
Expenditures for Research & Development / Sales	RDS
Total Debt / Total Assets	TDTA
Earnings Before Interest and Taxes / Sales	EBITS
Total Assets	TA
Industrial Diversification (Firm being active in more than one SIC-sector on the 2-digit level)	DummyISeg

Table 1: Overview on variables employed the study.

Sector / Country	M 1-6 Obs.	M 1-6 %	M 7-12 Obs.	M 7-12 %	M 13-18 Obs.	M 13-18 %	M 19-24 Obs.	M 19-24 %
Oil&Gas	37	3.2	34	3.2	83	3.1	74	3.1
Basic Materials	85	7.4	78	7.4	257	9.7	225	9.3
Industrials	260	22.8	245	23.2	693	26.1	653	26.9
Consumer Goods	229	20.1	225	21.3	512	19.3	507	20.9
Health Care	151	13.2	136	12.9	284	10.8	258	10.7
Consumer Services	40	3.5	36	3.4	88	3.3	76	3.1
Telecommunication	11	1.0	11	1.0	55	2.1	52	2.1
Utilities	34	3.0	35	3.3	82	3.1	83	3.4
Technology	271	23.8	242	22.9	549	20.6	467	19.2
Unspecified	23	2.0	14	1.4	51	1.9	31	1,3
Germany	770	67.5	711	67.3	1527	57.5	1375	56.7
France	297	26.0	272	25.8	705	26.6	627	25.8
Italy	74	6.5	73	6.9	422	15.9	424	17.5
Σ	1,141	100.0	1,056	100.0	2,654	100.0	2,426	100.0

Table 2: Composition of the model groups by sectors and countries for the complete sample.

	Mean	Median	S.D.	1	2	3	4	5	6	7	8
1. ROA	1.892	4.730	15.675	1.000							
2. FATA	34.145	32.900	24.305	.188 ***	1.000						
3. CETS	6.292	4.730	7.765	-.138 ***	-.035	1.000					
4. SAS	25.390	20.770	23.225	-.455 ***	-.137 ***	.265 ***	1.000				
5. RDS	9.724	3.300	29.894	-.353 ***	-.159 ***	.191 ***	.450 ***	1.000			
6. TDTA	19.195	17.410	17.254	-.042	.223 ***	.076 **	-.125 ***	-.067 *	1.000		
7. lnTA	13.751	13.651	2.559	.266 ***	.313 ***	.070 *	-.310 ***	-.188 ***	.264 ***	1.000	
8. DummyIseg	0.604	1.000	0.489	.057 .	.053 .	.027	-.165 ***	-.166 ***	.100 ***	.234 ***	1.000

Table 3: Summary statistics and correlation matrix for models 1-6 (N=1141).

	Mean	Median	S.D.	1	2	3	4	5	6	7	8	9
1. lnTQ	0.382	0.274	0.617	1.000								
2. FATA	34.456	32.990	24.154	.023	1.000							
3. CETS	5.931	4.705	6.186	.030	-.045	1.000						
4. SAS	24.416	20.545	20.046	.199 ***	-.118 ***	.099 **	1.000					
5. RDS	8.550	2.985	27.608	.130 ***	-.132 ***	.217 ***	.478 ***	1.000				
6. TDTA	19.145	17.750	15.994	-.179 ***	.264 ***	.133 ***	-.156 ***	-.137 ***	1.000			
7. EBITS	0.004	0.069	0.451	-.010	.164 ***	-.252 ***	-.609 ***	-.733 ***	.103 ***	1.000		
8. lnTA	13.855	13.728	2.522	-.149 ***	.316 ***	.164 ***	-.304 ***	-.151 ***	.303 ***	.243 ***	1.000	
9. DummyIseg	0.619	1.000	0.486	-.139 ***	.043	.051 .	-.133 ***	-.151 ***	.117 ***	.059 .	.219 ***	1.000

Table 4: Summary statistics and correlation matrix for models 7-12 (N=1056).

	Mean	Median	S.D.	1	2	3	4	5	6	7	8
1. ROA	1.224	3.965	16.247	1.000							
2. FSTS	53.416	56.925	25.718	.103 ***	1.000						
3. CETS	8.087	4.980	33.572	-.097 ***	-.042 *	1.000					
4. SAS	25.833	18.985	43.736	-.272 ***	-.023	.518 ***	1.000				
5. RDS	8.607	3.485	23.713	-.320 ***	-.058 **	.124 ***	.277 ***	1.000			
6. TDTA	20.312	18.805	16.757	-.010	.090 ***	-.007	-.108 ***	-.112 ***	1.000		
7. lnTA	13.641	13.381	2.422	.233 ***	.151 ***	-.010	-.182 ***	-.212 ***	.241 ***	1.000	
8. DummyIseg	0.587	1.000	0.492	.080 ***	.023	-.044 *	-.126 ***	-.156 ***	.079 ***	.214 ***	1.000

Table 5: Summary statistics and correlation matrix for models 13-18 (N=2654).

	Mean	Median	S.D.	1	2	3	4	5	6	7	8	9
1. lnTQ	0.394	0.217	0.817	1.000								
2. FSTS	53.812	57.670	25.647	-.012	1.000							
3. CETS	7.190	4.950	15.126	.044 *	-.003	1.000						
4. SAS	24.997	18.780	41.880	.067 ***	-.002	.534 ***	1.000					
5. RDS	7.776	3.260	21.962	.082 ***	-.076 ***	.204 ***	.276 ***	1.000				
6. TDTA	20.507	19.320	15.991	-.115 ***	.098 ***	.025	-.112 ***	-.162 ***	1.000			
7. EBITS	-0.015	0.065	0.583	-.025	.059 **	-.535 ***	-.763 ***	-.529 ***	.103 ***	1.000		
8. lnTA	13.723	13.416	2.392	-.157 ***	.144 ***	.015	-.177 ***	-.188 ***	.249 ***	.195 ***	1.000	
9. DummyIseg	0.603	1.000	0.489	-.091 ***	.031	-.056 **	-.112 ***	-.150***	.079 ***	.099 ***	.208 ***	1.000

Table 6: Summary statistics and correlation matrix for models 19-24 (N=2426).

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
FATA	6.220 **	-4.071	5.808	-6.089	38.988 ***	23.949 .	0.270 **	-0.195	0.426	-0.033	1.363 *	0.573
FATA²	----------	----------	0.497	2.423	-95.870 ***	-80.412 **	----------	----------	-0.187	-0.208	-2.870 .	-1.830
FATA³	----------	----------	----------	----------	70.697 ***	60.754 **	----------	----------	----------	----------	1.947 .	1.188
CETS	-0.003	0.114	-0.004	0.114	-0.009	0.137	0.006 .	-0.004	0.006 .	-0.004	0.006 .	-0.003
SAS	-0.216 ***	-0.323 ***	-0.216 ***	-0.323 ***	-0.217 ***	-0.318 ***	0.007 ***	0.006 *	0.007 ***	0.006 .	0.006 ***	0.006 *
RDS	-0.096 **	-0.074 *	-0.096 **	-0.074 *	-0.090 **	-0.071 *	0.005 ***	0.004 ***	0.005 ***	0.004 ***	0.005 ***	0.004 ***
TDTA	-0.162 ***	-0.153 ***	-0.162 ***	-0.153 ***	-0.161 ***	-0.153 ***	-0.005 **	-0.004 *	-0.005 **	-0.004 *	-0.005 **	-0.004 *
EBITS	----------	----------	----------	----------	----------	----------	0.453 ***	0.398 ***	0.452 ***	0.394 ***	0.436 ***	0.393 ***
lnTA	0.733 ***	0.745 ***	0.737 ***	0.767 ***	0.743 ***	0.768 ***	-0.029 **	-0.030 **	-0.030 **	-0.032 ***	-0.030 **	-0.031 **
Dummy Iseg	-2.038 *	-1.820 *	-2.030 *	-1.780 *	-2.110 *	-1.884 *	-0.039	-0.019	-0.042	-0.022	-0.046	-0.024
FATA* CETS	----------	-0.004 .	----------	-0.004 .	----------	-0.005 *	----------	3.211e-4 **	----------	3.309e-4 **	----------	2.999e-4 **
FATA* SAS	----------	0.005 ***	----------	0.005 ***	----------	0.005 ***	----------	3.22e-5	----------	3.64e-5	----------	2.35e-5
FATA* RDS	----------	2.636e-4	----------	2.994e-4	----------	1.329e-4	----------	3.174e-4 ***	----------	3.11e-4 ***	----------	3.144e-4 ***
Constant	-2.406	-0.073	-2.431	-0.199	-3.867	-1.718	0.016	0.152	0.023	0.162	-0.009	0.130
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,141	1,141	1,141	1,141	1,141	1,141	1,056	1,056	1,056	1,056	1,056	1,056
F-Statistic	31.248	8.151	7.377	7.951	43.713	7.906	22.045	10.019	9.174	11.957	24.129	13.068
Adj. R²	0.319	0.341	0.319	0.340	0.326	0.346	0.201	0.227	0.200	0.227	0.204	0.228

Table 7: OLS multivariate regression models with Newey-West standard estimates ('***', '**', '*' and '.' denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year dummies are estimated but are not reported here.

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
FSTS	3.652 **	1.762	3.075	1.900	11.016	8.588	0.093	0.120	-0.101	-0.084	0.174	0.222
FSTS²	----------	----------	0.581	-0.139	-17.373	-15.165	----------	----------	0.194	0.203	-0.423	-0.478
FSTS³	----------	----------	----------	----------	11.008	9.212	----------	----------	----------	----------	0.376	0.414
CETS	0.024 .	0.085 **	0.024 .	0.085 **	0.024 .	0.085 **	0.002	5.495e-4	0.002	3.729e-4	0.002	3.835e-4
SAS	-0.073 *	-0.219 ***	-0.073 *	-0.219 ***	-0.073 *	-0.218 ***	0.002 *	0.004 **	0.002 *	0.004 **	0.002 *	0.004 **
RDS	-0.165 ***	-0.062 *	-0.165 ***	-0.062 *	-0.164 ***	-0.061 *	0.003 ***	0.002 *	0.003 ***	0.002 *	0.003 ***	0.002 *
TDTA	-0.118 ***	-0.120 ***	-0.118 ***	-0.120 ***	-0.119 ***	-0.121 ***	-0.004 ***	-0.003 ***	-0.003 ***	-0.003 ***	-0.004 ***	-0.003 ***
EBITS	----------	----------	----------	----------	----------	----------	0.211 **	0.211 ***	0.211 **	0.211 ***	0.210 **	0.210 ***
lnTA	0.898 ***	0.778 ***	0.901 ***	0.777 ***	0.900 ***	0.776 ***	-0.048 ***	-0.047 ***	-0.047 ***	-0.046 ***	-0.047 ***	-0.046 ***
Dummy Iseg	-0.976 .	-1.019 .	-0.974.	-1.020 .	-0.974 .	-1.020 .	-0.050	-0.050	-0.049	-0.049	-0.049	-0.049
FSTS* CETS	----------	-8.251e-4	----------	-8.254e-4	----------	-8.174e-4	----------	3.19e-5	----------	3.45e-5	----------	3.48e-5
FSTS* SAS	----------	0.002 **	----------	0.002 **	----------	0.002 **	----------	-3.11e-5	----------	-3.15e-5.	----------	3.22e-5 .
FSTS* RDS	----------	-0.002 ***	----------	-0.002 ***	----------	-0.002 ***	----------	3.21e-5	----------	3.22e-5	----------	3.15e-5
Constant	-5.351 .	1.564	-5.283 .	-1.580	-5.939 *	- 2.151	0.529 .	0.472 .	0.552 *	0.496 .	0.528 .	0.469 .
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,654	2,654	2,654	2,654	2,654	2,654	2,426	2,426	2,426	2,426	2,426	2,426
F-Statistic	124.556	11.494	121.843	46.161	137.415	11.895	11.527	10.754	35.950	10.628	31.098	10.550
Adj. R²	0.208	0.230	0.207	0.230	0.208	0.230	0.112	0.112	0.112	0.112	0.111	0.112

Table 8: OLS multivariate regression models with Newey-West standard estimates ('***', '**', '*' and '.' denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year dummies are estimated but are not reported here.

	M 1-6			M 7-12			M 13-18			M 19-24		
	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.
ROA	4.200	4.970	10.625	----------	----------	----------	3.653	4.320	9.160	----------	----------	----------
lnTQ	----------	----------	----------	0.290	0.217	0.577	----------	----------	----------	0.302	0.162	0.768
FATA	35.897	35.390	24.155	35.367	34.815	23.877	----------	----------	----------	----------	----------	----------
FSTS	----------	----------	----------	----------	----------	----------	50.797	54.810	25.560	51.124	55.230	25.304
CETS	5.883	4.530	7.701	5.697	4.485	6.476	6.810	4.840	13.302	6.705	4.810	13.365
SAS	19.938	16.720	12.899	20.239	17.330	12.706	21.049	16.410	48.446	21.346	16.690	50.441
RDS	1.220	0.970	0.929	1.139	0.930	0.867	1.310	1.080	0.998	1.224	1.040	0.922
TDTA	22.015	21.670	15.165	22.162	21.985	15.093	13.578	23.480	15.916	23.904	23.830	15.762
EBITS	----------	----------	----------	0.077	0.076	0.136	----------	----------	----------	0.055	0.070	0.487
lnTA	14.159	14.135	2.369	14.194	14.144	2.317	14.063	13.876	2.301	14.064	13.844	2.277
DummyIseg	0.704	1.000	0.457	0.710	1.000	0.454	0.681	1.000	0.466	0.692	1.000	0.462
N	571			528			1,327			1,215		

Table 9: Summary statistics for less-R&D-intensive firms for models 1-24.

	M 1-6			M 7-12			M 13-18			M 19-24		
	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.
ROA	-0.421	4.230	19.196	----------	----------	----------	-1.204	3.540	20.794	----------	----------	----------
lnTQ	----------	----------	----------	0.474	0.378	0.643	----------	----------	----------	0.486	0.284	0.854
FATA	32.390	31.020	24.350	33.545	31.890	24.415	----------	----------	----------	----------	----------	----------
FSTS	----------	----------	----------	----------	----------	----------	56.036	58.970	25.617	56.509	59.800	25.716
CETS	6.703	5.055	7.814	6.164	4.970	5.878	9.364	5.150	45.550	7.676	5.110	16.698
SAS	30.852	24.955	29.228	28.592	23.445	24.658	30.616	22.220	37.871	28.660	21.120	30.588
RDS	18.243	8.790	40.550	15.960	8.120	37.618	15.905	7.960	31.897	14.350	7.600	29.655
TDTA	16.369	12.255	18.710	16.127	12.525	16.312	17.046	13.420	16.946	17.099	14.190	15.492
EBITS	----------	----------	----------	0.069	0.061	0.615	----------	----------	----------	0.085	0.057	0.659
lnTA	13.342	12.778	2.6767	13.516	13.029	2.671	13.219	12.667	2.467	13.381	12.840	2.456
DummyIseg	0.504	1.000	0.500	0.528	1.000	0.500	0.494	0.000	0.500	0.514	1.000	0.500
N	570			528			1,327			1,211		

Table 10: Summary statistics for R&D-intensive firms for models 1-24.

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
FATA	0.067	-3.813	-16.856 *	-21.600 **	11.465	9.552	-0.187 .	0.059	-0.102	0.118	0.346	0.339
FATA²	----------	----------	19.931 *	19.737 *	-63.616	-74.574	----------	----------	-0.101	-0.066	-1.447	-0.737
FATA³	----------	----------	----------	----------	63.154	71.187 .	----------	----------	----------	----------	1.039	0.516
CETS	0.022	0.119	0.023	0.083	0.032	0.104	-0.004	-0.009 .	-0.004	-0.009 .	-0.004	-0.009
SAS	-0.140 **	-0.180 *	-0.131 **	-0.184 *	-0.133 **	-0.191 **	0.011 **	0.016	0.011 **	0.016	0.011 **	0.016
RDS	-0.308	-1.276	-0.220	-1.121	-0.158	-1.305	0.018	0.050	0.018	0.049	0.019	0.047
TDTA	-0.116 **	-0.120 **	-0.113 **	-0.117 **	-0.109 **	-0.113 **	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
EBITS	----------	----------	----------	----------	----------	----------	0.115	0.169	0.118	0.171	0.119	0.170
LnTA	0.252	0.230	0.437	0.396	0.398	0.343	-0.030 .	-0.032 .	-0.031 *	-0.032 *	-0.032 *	-0.033 *
Dummy Iseg	-2.196 .	-1.919 .	-1.654	-1.403	-1.673	-1.371	0.081	0.064	0.078	0.063	0.077	0.063
FATA* CETS	----------	-0.003	----------	-0.002	----------	-0.002	----------	2.625e-4	----------	2.571e-4	----------	2.486e-4
FATA* SAS	----------	0.001	----------	0.002	----------	0.002	----------	-1.585e-4	----------	-1.597e-4	----------	-1.59e-4
FATA* RDS	----------	0.027	----------	0.026	----------	0.033	----------	-8.063e-4	----------	-8.014e-4	----------	-7.388e-4
Constant	5.905	7.348	4.686	6.840	4.123	6.652	0.146	0.048	0.148	0.046	0.154	0.050
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	571	571	571	571	571	571	528	528	528	528	528	528
F-Statistic	3.670	7.881	2.991	6.217	3.051	3.025	5.610	9.684	6.390	5.357	5.646	5.261
Adj. R²	0.110	0.112	0.121	0.122	0.129	0.133	0.187	0.191	0.185	0.190	0.184	0.188

Table 11: OLS multivariate regression models with Newey-West standard estimates for less R&D-intensive firms ('***', '**', '*' and '.' denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year dummies are estimated but are not reported here.

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
FSTS	-0.232	-1.000	-4.772	-5.287	32.611 **	32.688 **	-0.275 **	-0.165	-0.503	-0.487	0.583	0.543
FSTS²	----------	----------	4.833	4.603	-98.610 ***	-100.55 ***	----------	----------	0.242	0.352	-2.784	-2.533
FSTS³	----------	----------	----------	----------	75.152 ***	76.204 ***	----------	----------	----------	----------	2.212	2.102
CETS	0.058 *	0.120 *	0.057 *	0.114 *	0.049 *	0.137 *	1.419e-4	-0.007	1.38e-5	-0.008	-1.099e-4	-0.007
SAS	-0.036 ***	-0.114 **	-0.036 ***	-0.114 **	-0.038 ***	-0.104 *	0.002	0.007	0.002	0.007	0.002	0.008
RDS	-0.238	-0.241	-0.229	-0.200	-0.118	-0.366	-0.006	0.030	-0.005	0.036	-0.002	0.026
TDTA	-0.093 ***	-0.095 ***	-0.093 ***	-0.095 ***	-0.100 ***	-0.103 ***	-0.003 .	-0.002 .	-0.003 .	-0.002 .	-0.003 .	-0.003 .
EBITS	----------	----------	----------	----------	----------	----------	0.0236 *	0.173	0.226 *	0.155	0.230 *	0.141
lnTA	0.177	0.152	0.198	0.172	0.194	0.166	-0.048 ***	-0.045 ***	-0.046 ***	-0.043 ***	-0.047 ***	-0.043 ***
Dummy Iseg	-1.243 *	-1.264 *	-1.236 *	-1.260 *	-1.364 *	-1.361 *	-0.036	-0.039	-0.036	-0.038	-0.038	-0.040
FSTS* CETS	----------	-0.002 .	----------	-0.001 .	----------	-0.002 *	----------	1.746e-4	----------	1.85e-4	----------	1.703e-4
FSTS* SAS	----------	0.001 *	----------	9.990e-4 *	----------	9.232e-4 *	----------	-8.04e-5	----------	-8.48e-5	----------	-5.61e-4
FSTS* RDS	----------	1.317e-4	----------	-5.173e-4	----------	0.005	----------	-7.169e-4	----------	-8.011e-4	----------	-8.85e-5
Constant	8.070 **	9.356 ***	8.514 **	9.767 ***	6.980 **	8.055	0.513	0.396	0.546	0.434	0.482	0.375
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,327	1,327	1,327	1,327	1,327	1,327	1,215	1,215	1,215	1,215	1,215	1,215
F-Statistic	9.811	13.819	42.372	65.592	10.468	42.614	38.770	20.093	43.867	24.225	30.940	16.676
Adj. R²	0.124	0.126	0.124	0.126	0.141	0.143	0.096	0.097	0.096	0.097	0.097	0.098

Table 12: OLS multivariate regression models with Newey-West standard estimates for less-R&D-intensive firms ('***', '**', '*' and '.' denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year dummies are estimated but are not reported here.

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
FATA	12.146 ***	2.072	19.385 *	9.179	58.217 ***	45.167 **	0.597 ***	0.245	0.560	0.199	1.068	0.631
FATA²	----------	----------	-8.907	-9.496	-120.171 **	-107.009 **	----------	----------	0.045	0.068	-1.368	-1.067
FATA³	----------	----------	----------	----------	79.034 ***	69.924 **	----------	----------	----------	----------	0.978	0.800
CETS	-0.042	0.050	-0.034	0.032	-0.069	0.035	0.019 ***	0.015 .	0.019 ***	0.015 .	0.019***	0.015 .
SAS	-0.239 ***	-0.317 ***	-0.240 ***	-0.318 ***	-0.235 ***	-0.307 ***	0.004.	0.004	0.004 .	0.004	0.004 .	0.004
RDS	-0.079 *	-0.061 .	-0.079 *	-0.058 .	-0.073 *	-0.056	0.005 ***	0.004 ***	0.005 ***	0.004 ***	0.005 ***	0.004 ***
TDTA	-0.196 ***	-0.175 ***	-0.198 ***	-0.177 ***	-0.198 ***	-0.180 ***	-0.007***	-0.006 **	-0.007 ***	-0.006 **	-0.007 ***	-0.006 **
EBITS	----------	----------	----------	----------	----------	----------	0.395 ***	0.388 **	0.395 ***	0.390 **	0.386 ***	0.388 **
LnTA	1.146 ***	1.202 ***	1.059 **	1.120 **	1.129 **	1.160 ***	-0.018	-0.018	-0.018	-0.017	-0.017	-0.016
Dummy Iseg	-2.239 .	-2.040	-2.329 .	-2.103	-2.404 .	-2.241 .	-0.121 *	-0.099 *	-0.120 *	-0.098 *	-0.123 *	-0.100 *
FATA* CETS	----------	-0.003	----------	-0.003	----------	-0.004	----------	1.095e-4	----------	1.027e-4	----------	0.921e-4
FATA* SAS	----------	0.005 **	----------	0.005 **	----------	0.004 **	----------	0.11e-4	----------	-7.88e-6	----------	-1.67e-6
FATA* RDS	----------	-0.002	----------	-0.002	----------	-0.002	----------	2.305e-4 *	----------	2.337e-4 *	----------	2.364e-4 *
Constant	-3.905	-3.105	-3.377	-2.581	-6.095	-5.010	0.097	0.112	0.095	0.108	0.059	0.078
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	570	570	570	570	570	570	528	528	528	528	528	528
F-Statistic	146.217	172.786	146.999	169.310	139.587	159.309	27.871	26.793	61.949	76.240	26.099	25.860
Adj. R²	0.397	0.407	0.397	0.407	0.404	0.412	0.273	0.282	0.272	0.281	0.271	0.280

Table 13: OLS multivariate regression models with Newey-West standard estimates for R&D-intensive firms ('***', '**', '*' and '.' denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year dummies are estimated but are not reported here.

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
FSTS	5.795 *	14.501 ***	11.540 .	25.366 ***	19.508 .	38.407 **	0.345 **	0.346 *	0.456 .	0.479 .	0.536	0.574
FSTS²	----------	----------	-5.472	-9.949 *	-21.912	-36.181 .	----------	----------	-0.106	-0.122	-0.270	-0.313
FSTS³	----------	----------	----------	----------	9.267	14.730 .	----------	----------	----------	----------	0.091	0.106
CETS	0.068 **	0.054 .	0.068 **	0.054 .	0.069 **	0.053 .	0.002	-2.366e-4	0.002	-2.551e-4	0.002	-2.871e-4
SAS	-0.193 ***	-0.146 *	-0.193 ***	-0.143 *	-0.193 ***	-0.140 *	0.003 *	0.002	0.003 *	0.002	0.003 *	0.002
RDS	-0.106 ***	-0.070 **	-0.105 ***	-0.067 **	-0.104 ***	-0.066 **	0.002 **	0.003 ***	0.002 **	0.003 ***	0.002 **	0.003 ***
TDTA	-0.159 ***	-0.153 ***	-0.162 ***	-0.159 ***	-0.165 ***	-0.163 ***	-0.003 *	-0.003 *	-0.003 *	-0.003 *	-0.003 *	-0.003 *
EBITS	----------	----------	----------	----------	----------	----------	0.175 **	0.167 **	0.175 **	0.166 **	0.175 **	0.166 **
lnTA	1.301 ***	1.116 ***	1.269 ***	1.049 ***	1.268 ***	1.043 ***	-0.046 ***	-0.047 ***	-0.047 ***	-0.048 ***	-0.047 ***	-0.048 ***
Dummy Iseg	-1.005	-1.236	-1.051	-1.332	-1.043	-1.332	-0.031	-0.030	-0.032	-0.031	-0.032	-0.032
FSTS* CETS	----------	-3.366e-4	----------	-3.303e-4	----------	-3.069e-4	----------	4.33e-5	----------	4.35e-5	----------	4.41e-5
FSTS* SAS	----------	-0.002	----------	-0.002	----------	-0.002	----------	1.09e-5	----------	9.73e-6	----------	9.03e-6
FSTS* RDS	----------	-0.001 *	----------	-0.001 *	----------	-0.001 *	----------	4.09e-5	----------	-4.13e-5	----------	-4.13e-5
Constant	-13.522	-13.781 **	-14.216 **	-15.058	-14.971 **	-16.293	0.678	0.699	0.665 *	0.683 *	0.657 *	0.674 *
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,327	1,327	1,327	1,327	1,327	1,327	1,211	1,211	1,211	1,211	1,211	1,211
F-Statistic	130.971	12.547	9.152	150.849	9.871	167.916	25.025	24.856	8.925	8.590	8.700	8.403
Adj. R²	0.249	0.262	0.249	0.263	0.249	0.263	0.151	0.150	0.150	0.149	0.149	0.149

Table 14: OLS multivariate regression models with Newey-West standard estimates for R&D-intensive firms ('***', '**', '*' and '.' denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year dummies are estimated but are not reported here.

	M 1-6			M 7-12			M 13-18			M 19-24		
	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.
ROA	1.467	4.800	16.685	----------	----------	----------	0.776	4.105	16.476	----------	----------	----------
lnTQ	---------	----------	----------	0.399	0.258	0.660	----------	----------	----------	0.425	0.205	0.936
FATA	34.731	34.650	24.415	35.071	35.325	24.023	----------	----------	----------	----------	----------	----------
FSTS	---------	----------	----------	----------	----------	----------	52.518	55.995	25.520	53.085	57.435	25.481
CETS	10.002	7.440	9.562	9.307	7.300	7.226	13.373	7.840	46.858	11.623	7.710	20.465
SAS	25.472	19.120	27.450	23.896	18.945	22.265	27.874	18.155	59.472	26.567	18.140	56.962
RDS	11.608	3.590	38.326	10.165	3.475	37.035	10.415	3.610	30.794	9.221	3.460	29.389
TDTA	22.770	21.250	18.628	22.593	21.670	16.466	22.205	21.170	16.742	22.268	21.565	15.450
EBITS	---------	----------	----------	-0.022	0.087	0.600	----------	----------	----------	-0.055	0.073	0.797
lnTA	14.559	14.988	2.579	14.730	15.094	2.464	14.280	14.163	2.526	14.408	14.229	2.447
DummyIseg	0.639	1.000	0.481	0.657	1.000	0.475	0.621	1.000	0.485	0.634	1.000	0.482
N	571			528			1,328			1,208		

Table 15: Summary statistics for capital-intensive firms (models 1-24).

	M 1-6			M 7-12			M 13-18			M 19-24		
	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.
ROA	2.316	4.560	14.596	----------	----------	----------	1.673	3.825	16.007	----------	----------	----------
lnTQ	---------	----------	----------	0.366	0.287	0.572	----------	----------	----------	0.362	0.230	0.677
FATA	33.558	31.430	24.202	33.841	31.450	24.292	----------	----------	----------	----------	----------	----------
FSTS	---------	----------	----------	----------	----------	----------	54.316	57.585	25.892	54.533	57.875	25.801
CETS	2.576	2.585	1.253	2.555	2.535	1.240	2.793	2.840	1.301	2.793	2.830	1.298
SAS	25.308	21.700	18.051	24.935	21.725	17.555	23.788	19.990	16.713	23.439	19.640	16.495
RDS	7.836	2.785	17.659	6.934	2.685	12.208	6.797	3.300	13.024	6.342	2.915	10.017
TDTA	15.613	12.655	14.937	15.697	13.275	14.736	18.416	15.635	16.562	18.760	16.555	16.330
EBITS	---------	----------	----------	0.030	0.058	0.213	----------	----------	----------	0.025	0.057	0.211
lnTA	12.942	12.597	2.268	12.980	12.682	2.265	13.000	12.773	2.129	13.044	12.784	2.130
DummyIseg	0.568	1.000	0.496	0.581	1.000	0.494	0.554	1.000	0.497	0.573	1.000	0.495
N	570			528			1,326			1,218		

Table 16: Summary statistics for less-capital-intensive firms (models 1-24).

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
FATA	5.258 .	-2.799	2.456	-5.360	36.820 *	26.742	0.461 **	-0.352 .	0.439	-0.202	2.629 **	1.484
FATA²	----------	----------	3.399	3.225	-94.349 **	-81.048 *	----------	----------	0.026	-0.204	-6.167 **	-4.535 *
FATA³	----------	----------	----------	----------	70.174 ***	60.805 *	----------	----------	----------	----------	4,449 **	3.180 *
CETS	0.037	0.135	0.035	0.137	0.030	0.173	0.002	-0.011 *	0.002	-0.011 *	0.001	-0.008 .
SAS	-0.228 ***	-0.329 ***	-0.227 ***	-0.328 ***	-0.229 ***	-0.323 ***	0.005 .	0.004	0.005 .	0.004	0.004	0.004
RDS	-0.092 *	-0.062	-0.093 *	-0.063	-0.087 *	-0.061	-0.006 ***	0.005 ***	0.005 ***	0.005 ***	0.005 ***	0.004 ***
TDTA	-0.124 ***	-0.116 ***	-0.123 ***	-0.115 ***	-0.124 ***	-0.118 ***	0.387 ***	-0.005 **	-0.006 ***	-0.005 ***	-0.006 ***	-0.005 ***
EBITS	----------	----------	----------	----------	----------	----------	-0.081 ***	0.355 **	0.387 ***	0.352 **	0.349 ***	0.345 **
lnTA	0.681 *	0.697 **	0.715 *	0.729 *	-0.727 *	0.728 *	-0.004	-0.079 ***	-0.081 ***	-0.081 ***	-0.079 ***	-0.080 ***
Dummy Iseg	-0.743	-0.342	-0.698	-0.302	-0.897	-0.567	0.423 ***	0.040	-0.004	0.037	-0.015	0.027
FATA* CETS	----------	-0.004	----------	-0.004	----------	-0.005 .	----------	0.000 ***	----------	0.000 ***	----------	0.000 **
FATA* SAS	----------	0.006 ***	----------	0.006 ***	----------	0.005 **	----------	0.000	----------	0.000	----------	0.000
FATA* RDS	----------	-0.002	----------	-0.002	----------	-0.002	----------	0.000 *	----------	0.000 *	----------	0.000 *
Constant	-2.312	-0.477	-2.476	-0.659	-3.989	- 2,498	0.955	1.131	0.955	1.137 ***	0.851 *	1.013 **
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	571	571	571	571	571	571	528	528	528	528	528	528
F-Statistic	4.647	35.445	4.601	36.103	49.033	5.602	108.651	177.681	105.978	10.790	68.807	113.424
Adj. R²	0.373	0.391	0.372	0.390	0.379	0.394	0.270	0.299	0.268	0.298	0.287	0.306

Table 17: OLS multivariate regression models with Newey-West standard estimates for capital-intensive firms ('***', '**', '*' and '.' denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year dummies are estimated but are not reported here.

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
FSTS	2.977 .	3.019	-4.259	-2.554	-5.710	-4.524	0.196	0.123	-0.064	-0.182	0.227	0,116
FSTS²	----------	----------	7.406	5.677	10.745	10.199	----------	----------	0.265	0.307	-0.400	-0.371
FSTS³	----------	----------	----------	----------	-2.064	-2.794	----------	----------	----------	----------	0.407	0.415
CETS	0.021 .	0.065 *	0.020 .	0.064 *	0.020	0.064 *	0.001	-0.005	0.001	-0.005	0.001	-0.005
SAS	-0.062 *	-0.172 **	-0.062 *	-0.172 **	-0.062 *	-0.172 **	0.001	0.002	0.001	0.002	0.001	0.002
RDS	-0.154 ***	-0.058 *	-0.155 ***	-0.059 *	-0.155 ***	-0.059 *	0.002 **	0.002 *	0.002 **	0.002 *	0.002 **	0.002 *
TDTA	-0.108 ***	-0.109 ***	-0.106 ***	-0.108 ***	-0.106 ***	-0.107 ***	-0.006 ***	-0.006 ***	-0.006 ***	- 0.006 ***	-0.006 ***	-0.006 ***
EBITS	----------	----------	----------	----------	----------	----------	0.148 *	0.147 *	0.147 *	0.145 *	0.147 *	0.146 *
lnTA	1.062 ***	0.887 ***	1.088 ***	0.909 ***	1.087 ***	0.908 ***	-0.075 ***	- 0.074 ***	-0.074 ***	-0.073 ***	-0.074 ***	-0.073 ***
Dummy Iseg	-0.456	-0.315	-0.415	-0.285	-0.412	-0.281	-0.084	-0.085	-0.082	-0.083	-0.083	-0.084
FSTS* CETS	----------	-0.000	----------	-0.000	----------	-0.000	----------	0.000	----------	0.000	----------	0.000
FSTS* SAS	----------	0.000 .	----------	0.001	----------	0.001 .	----------	-0.000	----------	-0.000	----------	-0.000
FSTS* RDS	----------	-0.003 ***	----------	-0.003 ***	----------	-0.003 ***	----------	0.000	----------	0.000	----------	0.000
Constant	-9.401 **	-5.932 .	-8.196 *	-5.028	-8.062 *	-4.844	0.738 *	0.768 *	0.783	0.822 *	0.754 *	0.791
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,328	1,328	1,328	1,328	1,328	1,328	1,208	1,208	1,208	1,208	1,208	1,208
F-Statistic	7.178	9.085	148.765	8.884	7.056	8.971	9.395	8.991	54.578	8.860	9.088	51.567
Adj. R²	0.273	0.303	0.274	0.303	0.273	0.303	0.135	0.134	0.134	0,134	0.134	0.134

Table 18: OLS multivariate regression models with Newey-West standard estimates for capital-intensive firms ('***', '**', '*' and '.' denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year dummies are estimated but are not reported here.

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
FATA	6.506 *	3.864	6.158	-1.856	41.772 *	24.061	0.126	0.007	0.511	0.246	0.627	0.156
FATA²	----------	----------	0.419	6.609	-105.574 *	-73.106	----------	----------	-0.457	-0.331	-0.794	-0.085
FATA³	----------	----------	----------	----------	79.537 *	59.576 .	----------	----------	----------	----------	0.248	-0.181
CETS	0.122	1.448	0.122	1.447	0.201	1.329	-0.018	-0.030	-0.016	-0.033	-0.016	-0.033
SAS	-0.208 ***	-0.315 ***	-0.208 ***	-0.316 ***	-0.207 ***	-0.313 ***	0.008 ***	0.009 *	0.008 ***	0.009 *	0.008 ***	0.009 *
RDS	-0.112 ***	-0.130 ***	-0.113 ***	-0.133 ***	-0.106 ***	-0.125 ***	0.008 *	0.002	0.008 *	0.003	0.008 *	0.003
TDTA	-0.195 ***	-0.188 ***	-0.195 ***	-0.187 ***	-0.191 ***	-0.185 ***	-0.003	-0.002	-0.003	-0.002	-0.003	-0.002
EBITS	----------	----------	----------	----------	----------	----------	0.777 ***	0.674 **	0.764 ***	0.665 **	0.761 ***	0.665 **
LnTA	0.914 **	0.767 *	0.917 **	0.819 *	0.897 **	0.808 *	0.024 *	0.026 *	0.020	0.023 .	0.020	0.023 .
Dummy Iseg	-3.026 *	-2.896 *	-3.018 *	-2.763 *	-2.987 *	-2.752 *	-0.050	-0.044	-0.057	-0.049	-0.058	-0.049
FATA* CETS	----------	-0.041	----------	-0.041	----------	-0.036	----------	1.569e-4	----------	2.8e-4	----------	2.862e-4
FATA* SAS	----------	0.004 *	----------	0.005 *	----------	0.004 *	----------	-7.62e-5	----------	-7.03e-5	----------	-6.9e-5
FATA* RDS	----------	0.004	----------	0.004	----------	0.004	----------	4.22e-4 ***	----------	4.1e-4 ***	----------	4.113e-4 ***
Constant	4.756	7.413	4.707 *	6.744	5.337	-7.573	1.310 ***	1.265	1.333	1.289	1.340 ***	1.286 ***
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	570	570	570	570	570	570	528	528	528	528	528	528
F-Statistic	7.028	7.279	6.532	9.754	6.938	9.721	242.535	44.512	24.410	31.505	126.426	159.298
Adj. R²	0.237	0.269	0.235	0.268	0.244	0.273	0.231	0.251	0.232	0.251	0.231	0.250

Table 19: OLS multivariate regression models with Newey-West standard estimates for less-capital intensive firms ('***', '**', '*' and '.' denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year dummies are estimated but are not reported here.

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
FSTS	4.789 *	3.858	11.703 *	9.294	28.165 **	21.395 *	0.011	-0.444 *	-0.019	-0.432	0.351	-0.054
FSTS²	----------	----------	-6.837	-5.697	-43.349 *	-31.855 .	----------	----------	0.030	-0.013	-0.783	-0.813
FSTS³	----------	----------	----------	----------	22.138 *	15.866 .	----------	----------	----------	----------	0.489	0.483
CETS	0.310	2.152 **	0.329	2.104 **	0.347	2.117 **	0.010	-0.077 .	0.010	-0.077 .	0.010	-0.076 .
SAS	-0.206 ***	-0.366 ***	-0.206 ***	-0.366 ***	-0.204 ***	-0.360 ***	0.006 ***	0.005	0.006 ***	0.005	0.006 ***	0.005
RDS	-0.197 ***	-0.249 *	-0.196 ***	-0.249 *	-0.193 ***	-0.244 *	0.002	0.004	0.002	0.004	0.002	0.004
TDTA	-0.130 ***	-0.129 ***	-0.133 ***	-0.131 ***	-0.136 ***	-0.133 ***	-0.002 .	-0.002 .	-0.002	-0.002 .	-0.002 .	-0.002 .
EBITS	----------	----------	----------	----------	----------	----------	0.412 **	0.414 **	0.413 **	0.414 **	0.406 **	0.409 **
LnTA	0.645 **	0.625 *	0.593 *	0.582 *	0.579 *	0.573 *	-0.029 *	-0.029 *	-0.029 *	-0.030 *	-0.030 *	-0.030 *
Dummy Iseg	-1.583 *	-1.329	-1.594 *	-1.341 .	-1.554 .	-1.317	-0.010	-0.017	-0.010	-0.017	-0.009	-0.017
FSTS* CETS	----------	-0.034 **	----------	-0.033 **	----------	-0.033 **	----------	0.002 *	----------	0.002 *	----------	0.002 *
FSTS* SAS	----------	0.004 ***	----------	0.004 ***	----------	0.004 ***	----------	3.21e-5	----------	3.21e-5	----------	2.94e-5
FSTS* RDS	----------	7.438e-4	----------	7.641e-4	----------	7.143e-4	----------	-7.29e-5	----------	-7.27e-5	----------	-7.69e-5
Constant	2.844	2.214	2.412	2.046	1.179	1.016	0.427 .	0.723 .	0.429	1.047	0.723	1.016
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,326	1,326	1,326	1,326	1,326	1,326	1,218	1,218	1,218	1,218	1,218	1,218
F-Statistic	7.046	7.866	7.358	8.363	7.527	8.587	6.072	6.307	6.236	123.757	6.229	111.736
Adj. R²	0.156	0.174	0.156	0.174	0.158	0.175	0.109	0.115	0.109	0.114	0.109	0.114

Table 20: OLS multivariate regression models with Newey-West standard estimates for less-capital intensive firms ('***', '**', '*' and '.' denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year dummies are estimated but are not reported here.

	M 1-6			M 7-12			M 13-18			M 19-24		
	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.
ROA	0.016	5.180	19.943	----------	----------	----------	-1.157	4.130	21.235	----------	----------	----------
lnTQ	----------	----------	----------	0.524	0.432	0.667	----------	----------	----------	0.494	0.358	0.746
FATA	33.607	32.470	24.882	34.551	32.905	25.168	----------	----------	----------	----------	----------	----------
FSTS	---------	----------	----------	----------	----------	----------	53.616	56.560	26.653	54.198	57.190	26.570
CETS	6.165	4.430	8.273	5.531	4.360	5.523	9.164	4.660	46.868	7.552	4.660	20.025
SAS	38.985	32.930	26.157	37.103	31.910	21.406	39.971	30.500	58.375	38.323	29.820	55.994
RDS	15.761	6.080	41.122	13.531	5.150	38.158	12.951	4.890	31.899	11.450	4.440	29.714
TDTA	17.273	13.180	18.787	17.244	13.755	16.457	19.080	15.940	18.243	19.427	17.650	16.992
EBITS	---------	----------	----------	-0.053	0.087	0.625	----------	----------	----------	-0.089	0.072	0.809
lnTA	13.115	12.853	2.420	13.283	13.204	2.392	13.028	12.723	2.313	13.167	12.856	2.293
DummyIseg	0.531	1.000	0.499	0.555	1.000	0.497	0.518	1.000	0.500	0.544	1.000	0.498
N	571			528			1,327			1,213		

Table 21: Summary statistics for SAS-intensive firms (models 1-24).

	M 1-6			M 7-12			M 13-18			M 19-24		
	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.
ROA	3.770	4.255	9.315	----------	----------	----------	3.605	3.870	8.113	----------	----------	----------
lnTQ	----------	----------	----------	0.240	0.149	0.527	----------	----------	----------	0.293	0.125	0.871
FATA	34.685	33.430	23.723	34.360	33.245	23.119	----------	----------	----------	----------	----------	----------
FSTS	----------	----------	----------	----------	----------	----------	53.217	57.800	24.755	53.425	58.050	24.695
CETS	6.420	4.990	7.226	6.330	4.990	6.765	7.011	5.160	7.488	6.828	5.130	7.517
SAS	11.772	11.595	4.902	11.729	11.510	4.868	11.695	12.050	4.396	11.670	12.040	4.308
RDS	3.675	2.295	4.816	3.568	2.280	4.485	4.263	2.660	8.351	4.101	2.530	7.424
TDTA	21.120	19.690	15.343	21.046	19.650	15.299	21.543	20.750	15.032	21.587	20.820	14.851
EBITS	----------	----------	----------	0.061	0.060	0.103	----------	----------	----------	0.059	0.058	0.121
lnTA	14.388	14.221	2.537	14.427	14.230	2.521	14.253	14.009	2.373	14.279	13.989	2.361
DummyIseg	0.677	1.000	0.468	0.684	1.000	0.465	0.657	1.000	0.475	0.663	1.000	0.473
N	570			528			1,327			1,213		

Table 22: Summary statistics for less-SAS-intensive firms (models 1-24).

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
FATA	4.454	-11.784 *	-8.756	-28.975 *	10.438	-13.089	0.444 **	0.195	0.491	0.279	1.643 .	1.325
FATA²	----------	----------	15.445	19.609 .	-39.131	-21.596	----------	----------	-0.052	-0.103	-3.282	-2.751
FATA³	----------	----------	----------	----------	39.086 .	29.668	----------	----------	----------	----------	2.269	1.886
CETS	0.061	0.111	0.0570	0.149	0.041	0.163	0.009	-0.004	0.009	-0.004	0.007	-0.004
SAS	-0.299 ***	-0,379 ***	-0.299 ***	-0.386 ***	-0.299 ***	-0.383 ***	0.004	0.007 .	0.004	0.007 .	0.004	0.007 .
RDS	-0.062 *	-0,049	-0.064 *	-0.054 .	-0.060 *	-0.053 .	0.004 ***	0.004 ***	0.004 ***	-0.004 ***	0.004 ***	0.004 ***
TDTA	-0.253 ***	-0,241 ***	-0.253 ***	-0.240 ***	-0.251 ***	-0.240 ***	-0.005 *	-0.004 .	-0.005 *	-0.004	-0.005 *	-0.004
EBITS	----------	----------	----------	----------	----------	----------	0.343 ***	0.363 **	0.344 ***	0.363 **	0.319 **	0.354 **
lnTA	2.484 ***	2.495 ***	2.687 ***	2.737 ***	2.679 ***	2.718 ***	0.002	0.004	0.002	0.002	0.004	0.004
Dummy Iseg	-2.873 *	-2.754 *	-2.710 .	-2.551 .	-2.612 .	-2.509 .	-0.130 *	-0.098 .	-0.130 *	-0.099	-0.127 *	-0.097 .
FATA* CETS	----------	-0.002	----------	0.004	----------	-0.004	----------	0.000 *	----------	0.000 *	----------	0.000 .
FATA* SAS	----------	0.005	----------	0.005 **	----------	0.005 **	----------	-0.000	----------	-0.000	----------	-0.000
FATA* RDS	----------	-0.001	----------	-0.000	----------	-0.000	----------	0.000 **	----------	0.000 **	----------	0.000 **
Constant	-7.741	-5.733	-10.635	-9.172	-10.545	-9.059	-0.166	-0.278	-0.155	-0.257	-0.170	-0.274
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	571	571	571	571	571	571	528	528	528	528	528	528
F-Statistic	36.298	11.536	50.392	42.410	10.800	45.858	37.618	11.107	7.247	45.142	35.220	9.087
Adj. R²	0.438	0.445	0.440	0.448	0.441	0.448	0.169	0.191	0.167	0.190	0.172	0.192

Table 23: OLS multivariate regression models with Newey-West standard estimates for SAS-intensive firms ('***', '**', '*' and '.' denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year Dummies are estimated but are not reported here.

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
FSTS	5.976 **	2.818	7.703	4.823	8.891	6.258	0.152	0.218 .	0.117	0.188	0.640	0.729
FSTS²	----------	----------	-1.702	-1.944	-4.238	-4.991	----------	----------	0.034	0.029	-1.066	-1.099
FSTS³	----------	----------	----------	----------	1.458	1.751	----------	----------	----------	----------	0.624 .	0.639 .
CETS	0.019	0.079 *	0.019	0.079 *	0.019	0.079 *	0.001	-0.003	0.001	-0.003	0.001	-0.003
SAS	-0.064 *	-0.205 **	-0.064 *	-0.204 **	-0.064 *	-0.204 **	0.001	0.003	0.001	0.003	0.001	0.003
RDS	-0.142 ***	-0.047 *	-0.141 ***	-0.046 *	-0.141 ***	0.046 *	0.003 **	0.002 **	0.003 **	0.002 **	0.003 ***	0.002 **
TDTA	-0.164 ***	-0.166 ***	-0.165 ***	-0.167 ***	-0.165 ***	-0.167 ***	-0.004 **	-0.004 **	-0.004 **	-0.004 **	-0.004 **	-0.004 **
EBITS	----------	----------	----------	----------	----------	----------	0.129 *	0.126	0.129 *	0.126 *	0.129 *	0.126 *
LnTA	2.268 ***	2.105 ***	2.258 ***	2.094 ***	2.256 ***	2.091 ***	-0.015	-0.013	-0.014	-0.013	-0.016	-0.014
Dummy Iseg	-1.170	-1.241	-1.170	-1.240	-1.164	-1.233	-0.039	-0.039	-0.039	-0.039	-0.037	-0.036
FSTS* CETS	----------	-0.001	----------	-0.001	----------	-0.001	----------	0.000	----------	0.000	----------	0.000
FSTS* SAS	----------	0.001 *	----------	0.002 *	----------	0.002 *	----------	-0.000	----------	-0.000	----------	-0.000
FSTS* RDS	----------	-0.002 ***	----------	-0.002 ***	----------	-0.002 ***	----------	5.64e-6	----------	5.76e-6	----------	4.65e-6
Constant	-22.213 ***	-16.307 **	-22.428 ***	-16.564 **	-22.496 ***	-16.646	0.057	-0.020	0.061	-0.017	0.032	-0.047
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,327	1,327	1,327	1,327	1,327	1,327	1,213	1,213	1,213	1,213	1,213	1,213
F-Statistic	11.610	12.429	11.742	162.966	11.474	161.536	5.029	4.922	21.057	5.248	5.561	30.941
Adj. R²	0.246	0.264	0.246	0.263	0.245	0.263	0,129	0.130	0.128	0.129	0.129	0.130

Table 24: OLS multivariate regression models with Newey-West standard estimates for SAS-intensive firms (‘***’, ‘**’, ‘*’ and ‘.’ denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year Dummies are estimated but are not reported here.

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
FATA	3.325	7.453	0.287	5.170	53.310 **	51.079 **	0.044	-0.189	0.359	-0.150	-0.054	-0.436
FATA²	----------	----------	3.728	2.686	-153.668 **	-135.922 **	----------	----------	-0.398	-0.048	0.853	0.846
FATA³	----------	----------	----------	----------	118.390 **	104.415 **	----------	----------	----------	----------	-0.969	-0.695
CETS	0.097 *	0.165 .	0.096 *	0.161 .	0.123 *	0.175 *	0.005	-0.004	0.005	-0.004	0.005	-0.004
SAS	-0.048	0.151	-0.043	0.154	-0.050	0.115	0.011 *	0.014	0.010 *	0.014	0.010 *	0.014
RDS	-0.181	-0.570 *	-0.183	-0.571 *	-0.250 .	-0.560 *	0.006	-0.018	0.006 .	-0.018	0.006	-0.017
TDTA	-0.059 .	-0.066 *	-0.058 .	-0.065 *	-0.061 *	-0.066 *	-0.005 **	-0.005 **	-0.005 **	-0.005 **	-0.005 **	-0.005 **
EBITS	----------	----------	----------	----------	----------	----------	0.398	0.378	0.390	0.377	0.391	0.377
lnTA	-0.217	-0.102	-0.191	-0.085	-0.115	-0.037	-0.046 **	-0.052 ***	-0.048 ***	-0.053 ***	-0.048 ***	-0.053 ***
Dummy Iseg	-0.924	-1.181	-0.831	-1.113	-1.266	-1.445	0.075	0.080	0.064	0.079	0.067	0.081
FATA* CETS	----------	-0.002	----------	-0.002	----------	-0.002	----------	3.189e-4 **	----------	3.176e-4 **	----------	3.188e-4 **
FATA* SAS	----------	-0.006	----------	-0.006	----------	-0.005	----------	-1.802e-4	----------	1.804e-4	----------	-1.843e-4
FATA* RDS	----------	0.012 **	----------	0.012 **	----------	0.010 *	----------	9.053e-4 *	----------	8.981e-4 *	----------	8.871e-4 *
Constant	8.835 *	-6.487 *	8.740 *	6.471 *	6.424	4.830	0.417	0.600 **	-0.411	0.598	0.423 .	0.603
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	570	570	570	570	570	570	528	528	528	528	528	528
F-Statistic	3.064	3.631	3.102	3.610	4.031	3.578	34.398	9.462	28.272	71.827	19.126	73.691
Adj. R²	0.124	0.151	0.122	0.150	0.166	0.182	0.194	0.220	0.195	0.218	0.194	0.217

Table 25: OLS multivariate regression models with Newey-West standard estimates for less-SAS-intensive firms ('***', '**', '*' and '.' denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year dummies are estimated but are not reported here.

DV	ROA						lnTQ					
Models	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**	**Linear**	**Linear**	**Squared**	**Squared**	**Cubic**	**Cubic**
Variables	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
FSTS	0.469	0.172	-3.002	-3.378	18.956 .	18.279 .	0.042	0.007	-0.282	-0.318	-0.572	-0.762
FSTS²	----------	----------	3.556	4.205	-53.084 *	-51.318 *	----------	----------	0.332	0.395	1.086	1.531
FSTS³	----------	----------	----------	----------	39.124 *	38.371 *	----------	----------	----------	----------	-0.523	-0.788
CETS	0.166 ***	0.072	0.166 ***	0.068	0.166 ***	0.075	0.010 *	-1.475e-4	0.010 *	-7.025e-4	0.010 *	-9.715e-4
SAS	-0.017	0.027	-0.014	0.055	-0.012	0.056	0.013 *	0.023	0.013 *	0.026 .	0.013 *	0.026 .
RDS	-0.211 ***	-0.197 ***	-0.212 ***	-0.193 ***	-0.214 ***	-0.193 ***	-0.002	-0.009	-0.002	-0.009	-0.002	-0.008
TDTA	-0.077 ***	-0.076 ***	-0.076 ***	-0.074 ***	-0.079 ***	-0.077 ***	-0.005 ***	-0.005 ***	-0.005 ***	-0.004 ***	-0.005 ***	-0.004 ***
EBITS	----------	----------	----------	----------	----------	----------	0.407 .	0.299	0.393 .	0.287	0.393 .	0.285
lnTA	-0.202 .	-0.212 .	-0.186	-0.194 .	-0.126	-0.134	-0.065 ***	-0.067 ***	-0.064 ***	-0.066 ***	-0.064 ***	-0.067 ***
Dummy Iseg	-0.603	-0.618	-0.563	-0.573	-0.665	-0.672	-0.040	-0.041	-0.035	-0.035	-0.034	-0.033
FSTS* CETS	----------	0.002	----------	0.002	----------	0.002 **	----------	2.059^{e}-4	----------	2.129e-4	----------	2.185e-4
FSTS* SAS	----------	-8.589e-4	----------	-0.001	----------	-0.001 **	----------	-1.981e-4	----------	-2.516e-4	----------	-2.493e-4
FSTS* RDS	----------	-9.49e-5	----------	-2.072e-4	----------	-3.259e-4	----------	2.38e-4	----------	2.271e-4	----------	2.282e-4
Constant	9.782 ***	10.013 ***	10.163 ***	10.238	7.645 **	7.710 **	1.127	1.151 *	1.165	1.167 *	1.198 *	1.221 *
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,327	1,327	1,327	1,327	1,327	1,327	1,213	1,213	1,213	1,213	1,213	1,213
F-Statistic	70.016	4.925	5.183	73.309	5.161	5.070	277.431	6.008	291.443	5.831	4.991	5.691
Adj. R²	0.110	0.110	0.110	0.110	0.116	0.116	0.114	0.118	0.114	0.118	0.113	0.118

Table 26: OLS multivariate regression models with Newey-West standard estimates for less-SAS-intensive firms ('***', '**', '*' and '.' denote significance at the 0.001, 0.01, 0.05, and 0.1 level, respectively); industry dummies and year dummies are estimated but are not reported here.