

Determinants of Growth through Mergers and Acquisitions: An Empirical Analysis

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Abstract

This paper empirically investigates the determinants of external growth through mergers and acquisitions (M&As) in a typical Continental European country, Belgium. For this purpose, we use data on 378 private and listed firms that engaged in 816 M&A transactions during 1997–2005, and match this sample with companies that did not pursue any external growth. By analyzing bidder characteristics, industry and aggregate market variables, we are able to determine what motives are important in the decision to acquire. Our results show that intangible capital, leverage and firm size significantly positively affect the decision to grow through M&As whereas the proportion of debt that consists of bank loans and ownership concentration have a negative impact. Furthermore, M&As are significantly more likely in industries that were recently deregulated, that are less concentrated and where industry incumbents are operating at a relatively low scale. Also, the data indicate that internal and external investments are independent growth strategies. The results further show that the determinants of the M&A decision differ significantly in low- versus high-growth industries. Finally, investigating related versus diversifying M&As provides evidence supporting the market power and bankruptcy avoidance theory.

Keywords: mergers and acquisitions, growth, motives, ownership, financing

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1. Introduction

Mergers and acquisitions (M&As) are a popular means of growth for companies. In 2005 alone, 29,585 deals were announced worldwide, accounting for an aggregate deal value of USD 1 trillion in the USA and USD 883 billion in Europe.¹ There are various reasons why firms may choose to grow through M&A instead of expanding internally (e.g., Trautwein, 1990; Weston *et al.*, 2001; Gaughan, 2002). Acquiring a target in a line of business in which the bidding company wants to enlarge is often a faster way to grow than via internal expansion because the target is an organization already in place, with its own production capacity, distribution network, and clientele. This also reduces the risk of investing for the growing company. Besides, growing through M&A may be a cheaper alternative than internal expansion, in particular when the replacement cost of assets is higher than the market value of target assets. Finally, and in contrast to organic growth, M&As can be (partly) paid for with stock. This may be interesting for firms that do not have enough cash reserves and/or have fully used their debt capacity. The finance literature to date has concluded that especially during booming stock markets, bidding companies tend to pay for M&As with stock (e.g., Martin, 1996; Faccio and Masulis, 2005). Yet, as M&As and internal growth are not mutually exclusive investment decisions, firms may consider them as complements rather than being substitutes.

This paper investigates the determinants of bidder growth through M&A using logit regression analysis. More specially, we wish to determine what bidder characteristics, industry and aggregate market variables are relevant in a firm's decision to expand externally. Several studies have used logit or probit regression analysis to examine company features that likely make firms takeover *targets* (e.g., Dietrich and Sorenson, 1984; Palepu, 1986; Barnes, 1999; Powell, 2001). Only a few studies have investigated characteristics of bidding companies. Trahan (1993) and Sorenson (2000), for example, use data from the USA whereas Hay and Liu (1998) analyse M&A transactions in the UK. Also, Trahan (1993) and Hay and Liu (1998) study M&As in the fourth

¹ Source: FactSet Mergerstat Release: Global M&A Wrap Up for 2005

merger wave, investigating a sample from 1984–1987 and 1971–1989, respectively, while Sorenson (2000) sampled data from 1996, i.e. before the fifth merger wave actually took off. These studies conclude that the probability of making an acquisition is significantly related to several bidder characteristics. In particular, they document a positive relation with profitability, the market-to-book ratio and firm size whereas the impact of leverage is significantly negative.² However, these authors do not thoroughly investigate the impact of industry and aggregate market variables on the decision to grow through M&As.³ Consequently, firm size may spuriously capture the impact of industry concentration whereas the market-to-book ratio may reflect the ease of bidding companies to compensate target shareholders with stock in case of booming stock markets. In contrast, this paper pays careful attention to industry characteristics, such as the potential for economies of scale, industry concentration, sales growth and deregulation, and aggregate market variables, such as the historical volume of M&As, stock prices, GDP growth and the yield spread.

Next, as M&As and internal growth are not mutually exclusive investment decisions, this paper analyzes their interrelationship. On the one hand, a growing company could choose to grow through M&As in addition to internal expansion. Firms with many investment opportunities and easy access to financial resources may engage in both internal and external growth in order to take full advantage of their competitive advantage(s) in the fastest possible way. Consistent with this idea, Hay and Liu (1998) argue that a firm that is seeking to grow aggressively will often view

² A few studies have examined the relation between some isolated firm characteristics and the likelihood of engaging in M&As. As an example, Lehto and Lehtoranta (2004) investigate investments in R&D whereas Harford (1999) analyzes the role of cash reserves. Other studies indirectly examine the motives behind M&As. Berkovitch and Narayanan (1993) and Ismail (2005), for example, analyze the correlation between target and total gains in M&As and draw some inferences on the rationales underlying M&As. Berkovitch and Narayanan (1993) investigate a sample of 330 US tender offers during 1963–1988 whereas Ismail (2005) examines 76 M&As in the European banking industry during 1987–1999. Their results show that when total M&A gains are positive, the correlation between target and total gains is positive. They argue that this suggests synergy benefits are the primary motive in these M&As. On the other hand, when total M&A gains are negative, the correlation between target and total gains is negative, which they see as evidence of agency problems underlying these M&As. For their entire sample, the correlation between target and acquirer gains is not significantly different from zero, which, they argue, is consistent with the hubris hypothesis. However, several other forces may be driving mergers and acquisitions, such as the wish to increase market power, an industry restructuring, etc.

³ Only Hay and Liu (1998) have investigated the role of market structure to some extent by means of bidder market share and by identifying the industries that are dominated by a firm or a group of firms versus fragmented industries. They find that bidder market share is significantly negatively related to growth by acquisition. Also, dominant firms in industries with a dominant group have higher acquisition growth rates. This was not the case for single dominant firms and firms in fragmented industries.

acquisitions and internal growth as complementary strategies. Alternatively, external and internal growth could be substitutes if companies are financially constrained, for example. Finally, companies may specialize in either internal or external growth and these growth strategies, as a result, may be unrelated. Empirical research on the relation between external and organic growth is limited and has found conflicting results. Hay and Liu (1998), for example, examine M&As in the UK during the period 1971–1989 and conclude that M&As and internal expansion are complements. By contrast, Dickerson *et al.* (2003), using data on UK quoted firms in manufacturing during 1948–1970 and 1975–1990, find that the relation between internal growth and the likelihood of engaging in M&As is significantly negative, indicating that these growth strategies are substitutes.

To examine the above research questions, we use data on a sample of Belgian bidders during 1997–2005. Belgium has a typical Continental European blockholder system (Bratton and McCahery, 1999). Only a few companies are listed and there is a relatively high degree of ownership concentration in publicly quoted firms when compared with Anglo-Saxon countries. Holding companies, industrial corporations and families are the main investors in listed firms. Moreover, control in listed companies is levered by pyramidal and complex ownership structures (e.g., Renneboog, 2000; Faccio and Lang, 2002; Faccio and Masulis, 2005). This makes the threat of becoming a hostile takeover target non-effective for a lot of listed firms. Faccio and Masulis (2005), who investigate a sample of 3,667 European listed bidders during the period 1997–2000, among which 40 Belgian acquirers, find that the ultimate voting stake of the bidder's largest shareholder on average amounts to 32.04% in Belgium. This percentage is similar to that in the other Continental European countries included in their sample, such as France (30.01%) and Germany (30.57%). Also, they show that most Belgian bids are entirely cash financed (87.50%), which again is comparable to France (78.97%) and Germany (84.89%).

Overall, our study makes an interesting contribution to the literature for the following reasons. First, the motives underlying M&As are under-researched in the finance literature today.

Rather, prior studies have either focussed on the clustering of M&As over time or the value creation in M&As. The time-series literature on M&A activity has provided some explanations for why M&A activity tends to occur in waves (e.g., Gort, 1969; Roll, 1986; Golbe and White, 1988; Mitchell and Mulherin, 1996; Shleifer and Vishny, 2001; Rhodes-Kropf and Viswanathan, 2004). Empirical research on M&A value creation has focussed on the announcement returns in mergers or acquisitions. Studies on US data typically find that announcement returns are significantly positive for targets while they are zero or even negative for acquirers.⁴ For European bidders, though, announcement returns are positive or zero (e.g., Goergen and Renneboog, 2004; Campa and Hernando, 2004). Other studies have investigated the long-run performance of acquiring companies but the results are again not one-sided. Subsequent research has tried to link these announcement returns and long-run performance results to M&A deal features and bidder characteristics.⁵

Second, the limited number of studies on bidder motives in M&As mainly have examined M&As in the fourth merger wave, using data from the USA or the UK, whereas we use a set of M&A transactions from Belgium, a typical Continental European country, during 1997–2005, i.e. during the fifth merger wave. M&As during the 1980s, and particularly those in the USA, were initiated for different reasons than today's transactions. Gaughan (2002), for example, argues that M&As during the fourth wave were the result of significant inefficiencies in the way corporations were run on the one hand and the increased size of financial markets on the other. Also, the M&A wave of the 1980s was characterized by heavy use of leverage and hostility. In contrast, the current wave was largely initiated by global competition, technological change and deregulation (e.g., Weston and Jawien, 1999). In Europe, the integration process further strengthened this merger wave. According to Bruner (2004), the development of the European Union made it easier to

⁴ Jensen and Ruback (1983), Jarrell *et al.* (1988), Weston *et al.* (2001), Sudarsanam (2003) and Bruner (2004) provide an overview of the conclusions from various studies on the announcement returns of US M&As during different waves.

⁵ For example, Jensen and Ruback (1983) investigate the type of transaction whereas Travlos (1987), Loughran and Vijh (1997), Linn and Switzer (2001) examine the method of payment; cross-border versus domestic transactions are studied by Danbolt (2004), Goergen and Renneboog (2004), Conn *et al.* (2005), among others. Morck *et al.* (1990) investigate diversifying versus focusing M&As whereas Chang (1998) and Fuller *et al.* (2002) examine whether or not the target is publicly quoted. Finally, other studies have studied the role of bidder characteristics, such as the q-ratio, firm size, excess cash and managerial stock ownership (e.g., Servaes, 1991; Moeller *et al.*, 2004; Harford, 1999; Lewellen *et al.*, 1985).

transfer technology and intellectual capital, exploit economies of scale, realize capital market integration and reduce the idiosyncrasies of government regulation and tax policies. Hence, there is a need to also incorporate industry and overall market variables when analyzing the determinants of M&A activity in a Continental European context. Compared with the previous studies by Trahan (1993), Hay and Liu (1998) and Sorenson (2000), we are the first to include various industry and market variables in our analyses.

Moreover, corporate ownership and governance structures in Continental Europe, for example in Belgium, are very different from those in Anglo-Saxon countries. The number of listed firms is much higher in the USA or UK than in the average Continental European country. Not surprisingly, market capitalisation as a percentage of GDP amounts to 143.21% in the USA in 2005 while the average for EU-countries is only 79.68% (Eurostat). Hence, while the existing literature has largely focused on listed acquiring companies, it seems necessary to also include private bidders in a Continental European M&A study, which this paper does. Our sample indeed involves both publicly quoted and private bidders. Private firms may find it more difficult to finance their growth, especially M&As, as the latter deals cannot be staged, unlike some internal investments. If firm owners are financially constrained, they may have no alternative than to finance M&As by means of debt. Indeed, target shareholders may be unwilling to accept bidder stock when their company is taken over by a private company. In sum, when access to relatively cheaply priced debt financing is limited, the opportunities to grow through M&A are likely to be restricted for private enterprises. In contrast, listed companies can raise new equity rather easily through open-market stock issues or they can even offer new shares as compensation for their M&A in a stock swap. Besides, Pagano *et al.* (1998) show that a stock market introduction also reduces the cost of debt. Hence, quoted companies can more easily finance M&A transactions. However, listed firms in Continental Europe have much more concentrated ownership structure than those in the USA. La Porta *et al.* (1998), for example, show that for the ten largest publicly traded companies in various countries, the median ownership stake of the three largest shareholders amounts to 62% in Belgium while it is

only 15% in the UK and 12% in the USA. As large reference shareholders in Continental Europe typically have more control over the firm's resources and decisions, agency problems between managers and these shareholders should be less severe in Continental Europe on average while, simultaneously, controlling shareholders in listed (and non-quoted) firms may be reluctant to issue stock as compensation in M&A in order not to dilute their control.⁶ Hence, to differentiate between ownership concentration resulting in less agency problems of equity vis-à-vis ownership concentration restricting M&As because of the desire to maintain control, we will also examine whether the role of ownership concentration is the same in related versus unrelated M&As. Indeed, when managers pursue diversification of their human capital rather than shareholder wealth maximization, they may engage in diversifying M&As (see, for example, Amihud and Lev, 1981; Morck *et al.*, 1990). In addition, as Jensen (1986) points out that agency problems of equity are more important for firms with limited growth prospects, we will also split up the sample in low- and high-growth firms, respectively.

Our multivariate results show that intangible assets significantly positively influence the decision to grow through M&As. Further, internal cash flow generation and the stock of cash slack resulting from retained earnings seem to have no impact. Firm size is significantly positively related to the decision to engage in a merger or acquisition. The decision to grow externally is also affected by the firm's debt structure. Specifically, the debt ratio positively affects the decision to acquire whereas the portion of bank loans in the total debt has a significantly negative impact. Firm ownership concentration negatively influences the M&A decision. Yet, the interaction term between ownership concentration and internal cash flow generation and the cash reserves, respectively, is not significantly related to the probability of expanding through a merger or acquisition. Overall, these results are inconsistent with Jensen's free cash flow theory. In stead, our results suggest that companies with substantial intangible capital can add more value to takeover targets whereas the desire to maintain control limits a firm's external growth options. Furthermore,

⁶ We do want to point out that governance structures in the USA have become more performing in the last decades (e.g., Holmstrom and Kaplan, 2001).

we find that M&As are significantly related to industry characteristics. M&As are more likely in industries that are less concentrated and where industry incumbents are operating at a relatively low scale. In addition, M&As are significantly more likely in industries that have recently been deregulated.

When the sample is subsequently split into low- and high-growth industries, we find some important differences regarding the determinants of M&As. Leverage is no longer significant in the subsample of low-growth industries whereas, for companies in high-growth industries, the debt ratio becomes significantly negative. Also, ownership concentration and paying out dividends are only significant in explaining the probability of engaging in M&As in low-growth industries. Furthermore, while industry concentration and the scale of industry incumbents are only significant in explaining M&As in high-growth industries, deregulation seems only to matter in low-growth industries. Finally, there is some evidence that GDP growth significantly negatively affect the M&A decision of companies in low-growth industries.

Finally, distinguishing between related versus diversifying mergers and acquisitions learns that large non-dividend paying companies with more intangibles and a smaller debt ratio are more inclined to engage in diversifying M&As. Not surprisingly, when industry incumbents are operating a relatively large scale, acquiring companies are more likely to initiate unrelated M&As. Furthermore, the relation with industry growth is U-shaped whereas industry concentration bears an inverse U-shaped relation with the likelihood of a related M&A deal. Finally, a merger or acquisition is more likely to be related in periods of low stock prices.

The remainder of this paper is organized as follows. Section 2 provides an overview of the different hypotheses regarding the decision to grow through M&A. Section 3 describes the sample. The results from the logit regression analysis as well as several robustness checks are presented in Section 4. Section 5 concludes this paper.

2. Hypotheses

A number of arguments have been developed to explain *why* firms may choose to grow through M&As, besides or instead of internal expansion (see, for example, Trautwein, 1990; Weston *et al.*, 2001; Gaughan, 2002). In this section, we derive a set of testable predictions developed from these arguments. Important to note is that this study focuses exclusively on bidder characteristics, industry and aggregate market variables. Hence, although firms with net operating losses carried-forward may become attractive takeover *targets* and hence bidders may engage in M&As to reduce their overall tax bill, this type of motive cannot be captured by our study. Likewise, a merger or acquisition may be initiated because of unique *target* technology or managerial capabilities, but this rationale again cannot be gauged by looking solely at bidder features.

2.1. Synergies

Synergy benefits refer to the ability of a corporate combination to be more profitable than the individual firms that are combining (Gaughan, 2002). Trautwein (1990) distinguishes between three types of synergy benefits: operating, financial and managerial synergies. Operating synergy assumes that economies of scale exist in an industry and that prior to their M&A, firms are operating at levels of activity that fall short of achieving the potential for economies of scale (Weston *et al.*, 2001). Expansion through a merger or acquisition increases the size of the company and hence may lower per-unit costs. Financial synergy refers to the impact of a merger or acquisition on the combined firm's cost of capital. This can be achieved by lowering the systematic risk of the firm's investment portfolio. Alternatively, increasing firm size may improve company access to cheaper financing and/or create an internal market where capital can be allocated more efficiently. Finally, managerial synergies may arise from combining firms of unequal managerial capabilities.

This paper examines only the effects of operating and financial synergies underlying the decision to grow through M&A because we cannot differentiate between the managerial capabilities of the target and bidding companies from including only bidder characteristics. Operating synergies

will be examined by analysing the potential for economies of scale in an industry. For this purpose, we calculate the minimum efficient scale (MES) in an industry by means of the median of the natural logarithm of total assets in the firm's corresponding four-digit SIC industry.⁷ Following Huyghebaert and Van de Gucht (2004), we only consider industry incumbents older than ten years to determine the industry MES, as business start-ups typically enter the industry at a smaller scale. We expect a positive relation between the potential for scale economies and external growth as M&As may allow companies to realize economies of scale much faster, *ceteris paribus*. Furthermore, we expect economies of scale to be important only in related mergers and acquisitions.

Besides, new products and/or technologies may create an opportunity to realize synergies (Hall *et al.*, 1990; Lehto and Lehtoranta, 2004). Hence, we will also examine the effect of intangible assets on the decision to grow through M&As, because the larger a firm's intangible capital, the greater the potential for synergy benefits from transferring knowledge to another firm. M&As can also be used as a means to transfer knowledge in situations where collaborative and contractual schemes do not work (Lehto and Lehtoranta, 2006). Consistent with the above arguments, the empirical results of Lehto and Lehtoranta (2004) show that a firm's R&D stock (scaled by sales at constant prices) positively contributes to its likelihood of becoming an acquirer. By contrast, Blonigen and Taylor (2000) document a significantly negative relation between R&D investments (scaled by turnover and total assets, respectively) and the probability of engaging in M&A in high-technology industries. They conclude that firms in these industries specialize in either internal development of R&D or acquisitions. We will use the ratio of intangible assets (minus the accumulated goodwill paid in earlier M&As) to total assets and expect a positive relation with the decision to grow through M&A, both in related and unrelated transactions. According to the fourth directive of the European Community (25 July 1978), costs of research and development, concessions, patents, licences, trade marks and similar rights and assets may be capitalised on the

⁷ Alternatively, we will replace the log of total assets by the log of total sales and by the log of the number of employees as a robustness check.

balance sheet if they were acquired or created by the company itself, in so far as national law permits their being shown as assets. Belgian accounting law allows companies to capitalise their outlays on research and development, concessions, patents, licenses, and know-how when these are obtained by purchasing them, through own investments and through a merger or acquisition. When capitalising an internally created intangible asset, the book value equals the sum of all costs made to realize it, if these costs are not higher than a prudent estimate of the future return from this intangible asset, while the book value of externally acquired intangible assets equals the purchasing price (Article 60 KB 30/01/2001).⁸ Companies can choose to expense these outlays immediately in their income statement. Gaeremynck *et al.* (1998) investigate the capitalisation of research and development spending for 321 Flemish R&D spending firms. They find that only 65 capitalized their R&D spending. They further show that the decision to capitalise is significantly positively related to the position of the stake-holders (measured by return on investment and operational cash flow), the size of the firm and its R&D intensity (at least for firms in R&D-intensive sectors), while it is negatively related to the ability to repay debt. The positive relation between the decision to capitalize and R&D indicates that intangible assets is indeed a good proxy for R&D intensity.

Overall, it is important to control for the effect of company size. Large firms may be better able to realize efficiencies from, for example, the internalisation of talent or technologies from a target firm because they can apply these assets on a sufficiently large scale. Furthermore, large firms often have the financial resources needed to acquire other companies. Hence, combining with a financially constrained target may create an internal capital market, where capital is available at lower costs. Hence, we expect a positive relation between firm size (proxied by the natural logarithm of total assets) and the probability of engaging in M&A.⁹ Evidence for this relation was

⁸ Since 2005, Belgian publicly quoted companies have to file their annual accounts according to International Accounting Standards. IAS 38 requires an enterprise to recognize an intangible asset, whether purchased or self-created, if it is probable that the future economic benefits that are attributable to the asset will flow to the enterprise and the cost of the asset can be measured reliably. However, research costs always have to be expensed to the income statement. Development costs may be capitalized but only after the technical and commercial feasibility of the assets for sale or use have been established. In our sample, however, we only look at annual accounts before 2005 which are filed according to Belgian accounting law.

⁹ We also estimate the models after replacing the log of total assets by the log of total sales and by the log of the number of employees as a robustness check. However, it is not possible to collect sales figures for all these companies as

already documented by Trahan (1993), Harford (1999) and Maksimovic and Philips (2001), among others. Furthermore, we expect large firms to engage especially in diversifying M&As as there may be fewer opportunities for further growth in their own industry.

Finally, we will investigate the motive to realize financial synergies by looking at the capital structure of potential bidders. By engaging in *diversifying* M&As, highly leveraged firms may seek to reduce their systematic risk and realize a lower cost of capital. Exploiting such M&As can create additional borrowing capacity due to a *coinsurance effect*. The latter refers to the fact that combining two cash flow streams is less risky than the sum of the cash flow streams separately, provided that these cash flows are not highly correlated (Lewellen, 1970). We will measure firm leverage by means of the debt-to-total assets ratio.

2.2. Market power

In highly concentrated industries, firms tend to recognize the impact of their actions and policies on one another. This may influence firm reactions to changes in competitive behaviour, like price reductions, and possibly result in tacit collusion (Weston *et al.*, 2001). Horizontal mergers and acquisitions in concentrated industries may help companies to realize monopoly returns. This suggests a positive relation between industry concentration and external growth, particularly when M&A deals are related transactions. Consistent with this market power argument, Eckbo (1983) finds positive abnormal returns for rival firms around the announcement of an M&A of two competing companies. Yet, Eckbo also finds slightly positive abnormal returns when a lawsuit is filed by antitrust authorities, suggesting that horizontal M&As signal potential efficiency gains for rival firms rather than benefits from increased market power. Likewise, highly concentrated industries could have a lower incidence of M&As when there is less room for further consolidation, especially since antitrust authorities closely examine new deals. Consistent with the latter

small firms are not obliged to publish their sales. A company is regarded as small if not more than one of the following criteria is exceeded: an average annual workforce of 50 employees, an annual turnover (excluding VAT) of € 7,300,000 and total assets of € 3,650,000. If the average annual workforce exceeds 100 employees, a company is always considered as large. In our sample, 50.68% of the firms are small according to these criteria.

arguments, Andrade and Stafford (2004) find that industry concentration has a negative impact on the decision to grow through M&As. We will use the Herfindahl-Hirschman (HH) index to measure the extent of concentration within an industry. This measure is defined as the sum of squared market shares of all industry incumbents in the corresponding four-digit SIC industry. Its relation with the probability of M&A is an empirical question: positive when firms pursue increased market power and negative when further consolidation is difficult to achieve. Hence, we will also introduce a quadratic term in industry concentration to capture possible non-linearities. We then expect the simple term to have a positive coefficient whereas that of the quadratic term should be negative.

2.3. Industry shocks

Mitchell and Mulherin (1996), Andrade and Stafford (2004), Powell and Yawson (2005), among others, examine the effect of industry shocks on M&A activity across industries. A first important shock they investigate is sales growth. Firms in mature or declining industries may want to shift their resources into growing industries, to guarantee their long-run survival. Myers and Majluf (1984), for example, argue that the acquisition of targets with good growth prospects but limited cash by companies with plenty of financial slack but limited investment opportunities may be value-enhancing. Also, firms in low-growth industries may be obliged to consolidate in their own industries; this notion is commonly referred to as the bankruptcy-avoidance hypothesis. Hence, we expect companies in low-growth industries to engage especially in related M&As. Consistent with these arguments, Powell and Yawson (2005) find that takeovers tend to occur especially in low-growth industries. By contrast, others have argued that especially firms in high-growth industries are more likely to be acquirers, especially when their profitability allows buying industry peers. These companies then try to benefit as much as possible from the high growth in their industry by expanding through M&As, which often is the fastest way to grow. Hence, industry growth may be especially important in explaining related M&As. In sum, the relation between industry growth and

the likelihood of acquisition is an empirical question. We will investigate it by calculating the sales growth rate in each four-digit SIC industry in our sample. We will investigate both a single and a quadratic term of industry sales growth to capture a potential non-linear relation.

Besides, industry deregulation is also likely to be an important determinant of M&A activity across industries (e.g., Mitchell and Mulherin, 1996; Mulherin and Boone, 2000; Andrade *et al.*, 2001). Deregulation removes artificial constraints on the size of industry incumbents and induces market entry by new enterprises. In order to adapt to the changes engendered by deregulation, industries need to restructure and mergers and acquisitions can facilitate this process. Hence, we expect that firms tend to engage in M&As especially in industries subjected to deregulation, *ceteris paribus*. To test this hypothesis, we create a dummy variable that equals one for industries that were deregulated during the sampling period and zero otherwise. Of all industries that are included in our sample, only communication services and railroad companies experienced a deregulation during 1997–2005.

Finally, it may be important to control for overall economic growth in the above regression models. By incorporating the growth rate of real GDP in the previous year as an additional explanatory variable, we can better isolate the effect of industry growth from that of the overall economy. We expect a positive relation between GDP growth and M&As because companies may seek immediate increases in operating capacity when the economy is growing. The desire for firm growth through M&A might, in turn, be tempered by bad business conditions. Steiner (1975) and Guerard (1985, 1989) provide evidence for a positive relation between GDP and M&A activity. Melicher *et al.* (1983) investigate the relation between industrial production, business failures, stock prices, interest rates and M&A activity in the USA between 1947 and 1977. Their research presents interesting insights into the lead-lag relationship between macro-economic and capital market conditions. Yet, they only find a weakly positive relation between economic conditions and M&A activity, with changes in industrial production lagging behind changes in M&A activity. Other

studies have found a negative relation between GDP growth and M&A activity (see, for example, Beckenstein, 1979; Beckett, 1986).

2.4. Agency problems

Jensen (1986) argues that takeovers could be driven by agency problems between the management of a firm and its shareholders. Managers may have incentives to expand their firm beyond its optimal size. The reason is that growth generally increases managerial power and compensation. Moreover, it enables managers to diversify their wealth (including human capital) and improve job security when the target's cash flows are less than perfectly correlated with those of their own firm (Morck *et al.*, 1990). Hence, when these agency problems of equity are prevalent, we expect firms to pursue M&As, which allow growing at a faster rate, and diversifying M&As in particular.

Jensen (1986) further argues that especially managers of firms with large free cash flows tend to engage in value-decreasing takeovers. Hence, we expect a positive relation between internal cash generation and the decision to grow externally. We include EBITDA/total assets in our regression specification to proxy for internal cash flow generation. Alternatively, we will examine the cash ratio, to capture the effect of ready available cash reserves (instead of the annual cash generation). Consistent with this hypothesis, Harford (1999) finds that cash-rich firms are more likely to acquire other companies.

An important remark regarding agency problems of equity underlying the relation between EBITDA/total assets (cash ratio) and the M&A probability is that this relation should be weaker for firms with a highly concentrated ownership structure. Indeed, agency problems of equity tend to be less severe if a company's shares are highly concentrated in the hands of a few shareholders, as these investors tend to monitor the firm's management more closely. In Belgium, relatively few companies are listed on the stock exchange. Market capitalisation as a percentage of GDP amounts to only 81.92% in Belgium in 2005 while it equals 143.21% in the USA. Also, the majority of the shares in listed companies often are owned by a few institutional investors, industrial corporations

or families (Renneboog, 2000). As a result, the probability that managers in these firms will engage in value-destroying M&As can be expected to be lower. For private enterprises, ownership is even more concentrated and hence agency problems of equity are unlikely. In order to investigate the effects of ownership, we calculate an ownership concentration index using the sum of squared ownership percentages by a firm's various shareholders (see, for example, Agrawal and Mandelker, 1990; Duggal and Millar, 1999).¹⁰ We subsequently introduce interaction terms between ownership concentration and EBITDA/assets and the cash ratio, respectively, to capture the above managerial incentive problem story more accurately.¹¹ If agency problems of equity are prevalent, we expect these interaction terms to be significantly negative. The reason is that a highly concentrated ownership structure may allow restraining the wasteful investment of free cash flows.

Furthermore, ownership concentration by itself could capture the notion that firm owners may care about preserving control. Hence, they will avoid issuing stock as compensation in mergers and acquisitions. As their means of financing M&As is now restricted, this could negatively influence the probability of growth through M&A. So, based upon the above arguments, we expect a negative relation between ownership concentration and the probability of initiating an M&A in a particular year. Yet, a negative impact of ownership concentration by itself does not allow us to conclude that agency problems of equity are at work.

Finally, we control for the fact that firms paying out a large portion of their earnings as dividends have less cash available to spend on acquisitions (Jensen, 1986). Hence, the dividend payout ratio and the probability of external growth should be negatively related. Nevertheless, Trahan (1993) finds that listed firms that pay out a large portion of their earnings as dividends tend to become acquirers. He argues that firms with high payout ratios may temporarily reduce their dividends to finance the merger or acquisition. Yet, Trahan (1993) also finds that M&A

¹⁰ In Belgium, shareholders in publicly quoted companies have to report their ownership as soon as it reaches 5% of the company's capital stock and any subsequent multiple thereof. Companies can lower this threshold from 5% to 3%. For private companies, we were able to collect data on smaller ownership stakes, if available.

¹¹ Such interaction terms were not included in previous studies using US/UK data from the fourth M&A wave as publicly quoted firms in those countries generally were assumed to suffer from agency problems of equity, given their widely dispersed ownership. However, in our sample of Belgian firms, where listed companies and especially private firms have a highly concentrated ownership structure, agency problems may be less important on average.

announcement returns on average are lower for bidders that pay out large dividends. As many companies in our sample do not pay out any earnings, we will include a dummy variable that equals one if the company pays dividends and zero otherwise, and expect a negative relation with external growth.

Likewise, Jensen (1986) argues that the presence of debt reduces the free cash flows available for spending at managerial discretion. As a result, a firm's debt/assets ratio could negatively affect external growth. We will also examine the debt mix, i.e. the ratio of bank loans to total debt. Diamond (1984) and James (1987), among others, argue that banks have a cost advantage in producing and transferring information. Consequently, banks may help avoiding managerial over-investment problems. Another argument leading to a negative relation between bank loans/debt and the probability of M&A is provided by Wilner (2000) and Huyghebaert *et al.* (2006). They argue that credit market lenders, such as banks, follow stricter liquidation rules than suppliers upon a company's financial distress. Hence, companies may follow more conservative investment policies when their debt largely consists of bank loans.

2.5. Hubris

Roll (1986) argues that *hubris*, i.e. the excessive self-confidence of managers, is an important factor in explaining mergers and acquisitions. If there are no aggregate gains in takeovers, M&As may be caused by the bidder management's faith that their higher valuation of the target company is correct. Even with synergy gains and/or benefits from a change in control, competition among multiple bidders may lead the winning bidder to pay too much for the target firm. Overall, we expect hubris to be more prevalent in periods of high M&A activity, due to the herding behavior of managers. Scharfstein and Stein (1990) develop a model of investment decisions driven by herding behavior. They show that managers will mimic early movers, ignoring their own information.¹²

The above arguments suggest a clustering of M&As over time, which has been demonstrated by

¹² To be noted, Cabral (2002) argues that it can be rational for a manager to mimic other firms' M&A decisions, despite its private information against the takeover. In this case, a clustering of M&A activity does not need to imply managerial hubris.

Mitchell and Mulherin (1996), Mulherin and Boone (2000), Andrade and Stafford (2004), Powell and Yawson (2005), among others. To test the effect of hubris on the decision to grow through M&A, we introduce the volume of M&As in the previous year relative to the total number of M&As in the period 1997–2005 as an explanatory variable in our regression analysis and expect a positive parameter estimate.

Malmendier and Tate (2004) show that over-confident managers tend to get involved in diversifying M&As. They also document that these transactions in particular are unlikely to create value for the acquiring company. Hence, we expect that the volume of M&As should also be negatively related to the relatedness of M&A transactions under the hubris hypothesis.

2.6. Under-valuation/over-valuation hypothesis

If stock prices are sufficiently depressed, the takeover of a listed company may constitute a bargain relative to investing in new facilities from scratch (Golbe and White, 1988). Moreover, the valuation of non-quoted firms will also be lower in case of depressed stock prices, through the use of industry multiples or through the use of a higher risk premium when valuing target stock. This under-valuation hypothesis suggests that stock prices and the decision to grow through M&A might be negatively related. Consistent with these arguments, Golbe and White (1988) find a negative relation between Tobin's q , which captures the market value of the target relative to the replacement cost of its assets, and M&A activity.

On the other hand, rising stock prices can facilitate the financing of mergers and acquisitions when transactions can be compensated with stock. Myers and Majluf (1984) already argued that managers are more likely to issue new shares when they consider their stock to be over-valued. Shleifer and Vishny (2001) and Rhodes-Kropf and Viswanathan (2004) apply this idea of asymmetric information between firm-insiders and outsiders to explain M&A activity. Shleifer and Vishny (2001) model the behaviour of acquiring managers and conclude that managers in over-valued firms have an incentive to engage in stock acquisitions. Rhodes-Kropf and Viswanathan

(2004) demonstrate that target shareholders will accept these stock offers because they tend to overestimate the value of synergy benefits in an over-valued market. Martin (1996) and Faccio and Masulis (2005) find that bidding companies indeed are more inclined to pay with stock for their M&As in booming stock markets. This suggests a positive relation between stock prices and external growth. Nelson (1959), Melicher *et al.* (1983), Guerard (1985, 1989) and Becketti (1986), among others, further find that an increase in stock prices is followed by an increase in merger activity. Yet, it remains to be seen whether such a positive relation would hold in a sample of M&A bidders that is largely dominated by private companies, as ours. We will capture stock market performance in Belgium by means of the total return on the Belgian All Shares Index (BASI). Its relation with the incidence of M&As is an empirical question.

In addition, we will control for the yield spread between corporate and government bonds and the term spread between the yield on long-term government bonds and the yield on Treasury notes, as these may influence financing decisions and hence investments. The higher the yield spread, the more expensive it will be for a firm to borrow money. Overall, this will negatively impact firm investment rates, but as M&As can also be financed by means of stock (rather than public or private debt), the yield spread may positively affect the decision to grow through M&As. We measure the yield spread as the difference between the average yield on European corporate bonds with rating BBB and a duration of five years and the average yield on European government bonds, also with a duration of five years.¹³ Furthermore, the yield spread can also be considered as a measure for the economy's overall risk assessment by investors. When investors become more risk averse, they will demand a higher risk premium, *ceteris paribus*. Next, relatively high yields on long-term bonds can be attributed to expectations of future increases in the interest rate while relatively low yields on long-term bonds may be an indication of expectations of falling short-term interest rates. Hence, a positive relation between the term spread and the decision to engage in M&As may arise because relatively high yields on long-term bonds will make it more expensive to

¹³ Alternatively, we will estimate the model with the yield spread on bonds with a modified duration of ten years instead of five years.

finance internal investments compared to M&As as M&As can also be financed by means of stock issuance or a stock swap. We propose to work with the difference between the average yield on Belgian government bonds with a duration of five years and the yield on a Belgian Treasury Note with a maturity of three months.¹⁴

2.7. External versus internal investment

Growth through M&As and internal growth are not mutually exclusive investment decisions. Both have several advantages and disadvantages. Mergers and acquisitions are the fastest way to expand, because the target is an organization already in place, with its own production capacity, distribution network, and clientele. Also, external growth is often the most efficient way to obtain managerial talent and new/complementary technologies from a target company. However, by purchasing an existing company, the firm may not get exactly what it wants. Mergers and acquisitions often require additional internal investments in order to make best use of the acquired assets within the bidding company. Moreover, internal investment may be needed when it is not possible to obtain the required assets through M&A. These advantages and disadvantages suggest that internal and external growth are not necessarily substitutes, but that the choice of growth strategy may depend on the situation.

When a firm has many investment opportunities and easy access to external financing or can issue stock to finance its M&As, it may view internal and external growth as complementary strategies. Hay and Liu (1998), for example, argue that a firm that is seeking to grow aggressively will often view M&As and internal growth as complementary strategies. These authors investigate a sample of 110 manufacturing firms in the UK during 1971–1989 and find that the incidence of a takeover by a given firm is positively related to the investment rate of that firm. Their sample only includes listed firms, which probably are less financially constrained than private enterprises. Hence, some firms may lack the financial resources necessary to grow both internally and

¹⁴ Alternatively, we work with the yield on a Belgian Treasury Note with a maturity of six months to test the robustness of the results.

externally. If owners are financially constrained, firms may have no alternative than to finance M&As by means of debt, especially when target shareholders are unwilling to accept stock as compensation or when bidder owners wish to maintain control. Hence, a company may need to choose to grow through M&As, to the detriment of internal growth. Dickerson *et al.* (2003), for example, using data on UK quoted manufacturing companies during the periods 1948–1970 and 1975–1990, find that the relation between internal growth and the likelihood of takeover is significantly negative.

Nevertheless, it is also possible that internal and external expansion are independent growth strategies. The decision to grow through M&A could be determined by the availability of good external investment opportunities and the available resources to finance them, but may be independent of internal growth. This would suggest that internal growth is not significantly related to the decision to grow through M&A. Also, companies may specialize in one way of growth. Some firms may concentrate on searching potential targets and integrating the acquired assets, but they may find it difficult to create a plant from scratch. Conversely, other companies may have a history of successful internal growth, but may not have the ability to manage a merger or acquisition. Hence, the relation between internal growth and the likelihood of M&A is an empirical question, especially in a sample that is dominated by private bidders.

We will use the investment rate (the ratio of the change in tangible fixed assets (PPE), to which we add back depreciation, to total assets) as a proxy for internal growth. However, external growth may also positively influence a firm's fixed assets. To avoid this problem, we will also test the relation between the investment rate and external growth for a sample of acquiring firms that made one or more M&As in only one year during the sample period. Furthermore, to test the idea that financially constrained firms may find it difficult to finance their growth, we include an interaction term between the investment rate and (one minus the debt ratio) in our regression model, assuming that firms with a high debt ratio may have already fully used their borrowing capacity. Alternatively, we will include an interaction term between the investment rate and a dummy

variable that equals one for companies that are publicly quoted. If financial constraints limit complementary external growth, these interaction variables should be significantly positively related to the likelihood of M&A.

3. Sample

In this section, we discuss our sample selection criteria. Using the Zephyr database, we identified a sample of 378 Belgian bidders that announced at least one merger or acquisition during the period 1997–2005. The Zephyr database contains detailed information on over 400,000 M&A transactions worldwide. M&As involving public as well as private bidders are covered and there is no minimum deal value in order for M&As to be included in this database. We did not impose any restrictions on the target firms in order for M&A transactions to be retained in our sample. Hence, our sample includes data on domestic as well as cross-border mergers and acquisitions. On average, 53.19% of the M&As in our sample are cross-border deals. The three other countries Belgian bidders most actively aim for M&A targets are France (12.13%), The Netherlands (9.31%) and Germany (5.27%). Also, 41.30% of the bidders in our sample are publicly quoted, while only 2.57% of the target firms are publicly quoted.

Belgium has a typical Continental European blockholder system (Bratton and McCahery, 1999). Only a few companies are listed and there is a high degree of ownership concentration, even in publicly quoted firms. Holding companies, industrial corporations and families are the main investors and control in listed companies is levered by pyramidal and complex ownership structures (Renneboog, 2000). Furthermore, Faccio and Masulis (2005), who investigate a sample of 3,667 European listed bidders during 1997–2000, show that the ultimate voting stake of the bidder's largest shareholder averages to 32.04% for Belgian firms, which is similar to that in France (30.01%) and Germany (30.57%). In addition, most Belgian bids (87.50%) are entirely cash financed, like in the other Continental European countries in their sample (78.97% in France and 84.89% in Germany). Hence, our sample of Belgian bidders likely is representative for the

Continental European market. Furthermore, Figure 1 shows that M&A activity in Belgium follows the same pattern as that of the European Union. M&A activity increased steadily from 1997 till 2000. After a small decline in 2001 and 2002, M&A activity ticked up again afterwards and was at its highest level in 2005.

<insert Figure 1>

The reason why we focus on Belgian bidders is that the information in the Zephyr database can be easily combined with the financial statement information in the Belfirst database.¹⁵ The latter database contains detailed information on the annual accounts of more than 330,000 Belgian companies. In Belgium, small companies are allowed to file their financial statements in an abbreviated form while large companies have to file full accounts.¹⁶ In our sample, 49.32% of bidders report full accounts. The Belfirst database also provides information on the activities of the bidding companies, by means of their four-digit SIC industry codes. This information allowed us to calculate the relevant industry variables. We have excluded banks, insurance companies, real estate companies and holdings from our analyses, i.e. all companies with a main SIC code starting with 6. The reason is that these companies are still largely subject to extensive regulation whereas their accounting methods and reporting practices are different from those in other industries. Moreover, holdings have stakes in companies from various industries, which makes it difficult to investigate the role of industry characteristics.

For each sample firm, we randomly selected from Belfirst a non-acquiring company in the same industry, i.e. a firm with the same main four-digit SIC code that did not engage in any M&A during the whole sampling period. This matching procedure has already been used in the literature (e.g., Sorenson, 2000). We prefer random matching because when observations are not randomly drawn from the population, a selection bias may arise (Heckman, 1979). Hence, standard estimators and tests may result in misleading inferences (e.g., Verbeek, 2004). Matching acquiring

¹⁵ The Zephyr database and the Belfirst database are both commercialized by Bureau Van Dijk Electronic Publishing.

¹⁶ A company is regarded as small if not more than one of the following criteria is exceeded: an average annual workforce of 50 employees, an annual turnover (excluding VAT) of € 7,300,000 and total assets of € 3,650,000. If the average annual workforce exceeds 100 employees, a company is always considered as large.

and non-acquiring firms by means of certain criteria, like for example firm size, may induce problems as size itself could be an important determinant in explaining the M&A decision. Carson and Hoyt (2003), for example, investigate financial distress in the US life insurance industry and provide empirical evidence that matching on the basis of total assets and state of domicile results in biased conclusions. Variables identified as important measures of insolvency, coefficients and classification rates in their study differ across different matched-pair samples. Manski and Lerman (1977), Zmijewski (1984) and Palepu (1986) show that the use of a matched-pair sample design causes both parameter and probability estimates to be asymptotically biased because a firm's probability of being selected in the sample is a function of the dependent variable. However, matched-pair sampling is often justified on the grounds of efficiency, especially in the presence of high search costs. Hence, we choose to use a matched-pair design where matching is random except for industry relatedness.

An acquiring company is included in our sample only for the year(s) in which the firm initiates a merger or acquisition. The matching firm is also only included in the sample for the corresponding year. The Belfirst database was also the main information source for bidder ownership information.¹⁷ Stock market return data were calculated based upon the Belgian All Shares Index (BASI), which was collected from Belgostat. The GDP growth rate at constant prices was downloaded from Eurostat whereas bond yields were retrieved from Bloomberg.

In our analyses, we include all announced transactions that are covered by the Zephyr database, irrespective of whether they were completed or not. The reason why we focus on *announced* transactions is that our research investigates the *motives* behind the decision to grow through a merger or acquisition, regardless of the outcome of the transaction. Indeed, an intended transaction may not go through, because of, for example, a competing offer, no shareholder approval or antitrust problems. These actions are outside the scope of the firm's management.

¹⁷ Belfirst did not report the ownership information for all sample firms. We were able to collect ownership data on 435 sample firms and 84 matching firms. After contacting a randomly selected subsample of matching firms on which we did not have any ownership information, we learned that for almost all of these firms, 100% of the shares were being held by members of the same family. Hence, we made the assumption that the ownership concentration index equals one for all privately-held matching companies on which we did not have any ownership data.

Table 1 provides an overview of the current status of the 918 transactions that were captured from the zephyr database. This table shows that approximately 80% of the transactions in our sample were completed. Hence, only a small part of the announced transactions in our sample did not go through.

<insert Table 1>

Furthermore, some of the announced mergers or acquisitions are transactions whereby the bidding company already owned a controlling stake in the target company and simply increased this stake at the considered M&A. Hence, these transactions cannot really capture the intention of a company to follow an external growth strategy instead of investing from scratch, which is the focus of this paper. Van Hulle *et al.* (1991) show that Belgian bidders indeed often own large toeholds in the target before they engage in takeover bids. Table 2 shows the prior M&A ownership stake of the bidding company. For our analysis, we drop all transactions whereby the bidding company already owns 50% of the shares before the M&A. This case concerns 85 out of 918 transactions.¹⁸

<insert Table 2>

Next, some of our sample firms may belong to a corporate group rather than being independent. La Porta *et al.* (1998), for example, show that the image of the Berle and Means (1932) corporation with a widely dispersed ownership structure is only relevant for listed firms in Anglo-Saxon countries. In Continental Europe, on the other hand, firms are typically controlled by families, industrial corporations or even the State. Furthermore, La Porta *et al.* show that Belgium is the country with the highest presence of pyramidal structures in their sample. These findings are confirmed by Renneboog (2000), who also shows that holding companies are important investors in Belgian listed firms. These are often part of the pyramidal ownership structures and are used to lever control. Dewaelheyns and Van Hulle (2006) show that ignoring group ties may have a negative impact on predictive reliability in the context of failure prediction models.

¹⁸ La Porta *et al.* (1999) and Dinç (2005), among others, argue that an entity may have a controlling stake if this shareholder's voting rights exceed 20%. Hence, we also investigate whether our results are different when we look only at transactions whereby the bidding company's ownership stake is 20% or less before the M&A announcement. We identified 16 additional transactions where the bidder's ownership stake before the merger was between 20% and 50%. However, the results do not change when we drop these transactions from the sample.

The inclusion of group firms in our sample may lead to two problems. First, if we only look at direct ownership, our measure of ownership structure will be biased. Ultimate shareholders may control these direct shareholders through multiple tiers of ownership (e.g. Renneboog, 2000; Buysschaert *et al.*, 2004). Therefore will look at a shareholder's direct as well as its indirect ownership stake to calculate its ultimate ownership. Second, an internal capital market may be created between members of an industrial group and assets may be shifted from one entity to another. Deloof (1998) provides evidence for the importance of internal capital markets for Belgian private firms. By using consolidated financial statements, when available, this problem can be overcome. When the acquiring company is a member of an industrial group but does not consolidate itself, we look at the consolidated financial statements at the level of the ultimate owner.

All the explanatory variables in our analysis are lagged during one year.¹⁹ This may cause a problem only when a company undertakes an IPO in the same year as they make a merger or acquisition because the IPO may have a serious impact on several of our explanatory variables. In our sample, 17 transactions took place in the same year as the bidder's IPO. We will drop these transactions from the sample.

This resulted in a sample of 378 bidders that engaged in 816 M&A transactions between 1997 and 2005. Including acquiring firms that made more than one acquisition in a particular year only once for that specific year resulted in a sample of 585 observations. Overall, 470 bidders engaged in one M&A, 66 in two M&As and 49 in three or more M&A transactions in a particular year. The sample is largely dominated by takeovers (96.57%) rather than mergers (3.43%). Combining the sample firms with the matching firms resulted in a total sample of 1,170 observations from 155 different four-digit SIC industries. The industry distribution is shown in Table 3. The three industries most represented in this sample are food and kindred products, business services, and engineering and management services.

¹⁹ Alternatively, we will estimate the model were the explanatory firm variables are measured as the average of the value during the three years before the transaction.

<insert Table 3>

Table 4 provides an overview of the distribution of M&A transactions during the sampling period and their method of payment. Cash is being used more as payment method when the bidder is a privately held company (67.74% vis-à-vis 53.60% for public bidders). This is consistent with the idea that target shareholders may be unwilling to accept stock when their company is taken over by a private bidder.

<insert Table 4>

Table 5 presents an overview of the explanatory variables and the hypothesized sign of their relation with the probability of takeover. The data for both the acquiring and matching firms are measured one year before the transaction. To limit the influence of outliers, all variables are winsorized at 5–95%, i.e. extreme values are replaced by the corresponding percentiles. Table 6 contains summary statistics on the explanatory variables and reports for the firm-level characteristics the *p*-values corresponding to a parametric *t*-test and a non-parametric Wilcoxon signed-rank test, respectively. These tests investigate whether the variables are significantly different across acquiring and non-acquiring companies. Intangible assets (minus the goodwill paid in earlier M&A deals) are significantly higher in the acquiring sample (1.43%) than in the non-acquiring matching sample (0.64%) according to a Wilcoxon signed-rank test. Our results further show that EBITDA/total assets equals 10.27% for acquirers and 11.64% for non-acquirers. Further, the cash ratio is significantly larger for the non-acquiring companies (17.31%) than for the bidders (10.27%). The ownership concentration index amounts to 49.08% in the sample of firms that initiate M&As, which is significantly below the 95.54% for companies that do not engage in M&As. Furthermore, acquirers have significantly less debt outstanding than non-acquirers. The average debt/assets ratio for the acquiring sample equals 60.20% while it is 60.89% for the non-acquirers. However, acquirers have a significantly higher proportion of bank loans in total debt outstanding (41.37% vis-à-vis 30.39%). The data further show that acquirers pay out a larger portion of their earnings as dividends. The payout dummy equals one for 45.47% of the bidders

and 11.28% of the matching firms. Bidding companies are also significantly larger than non-acquiring firms. The results on the investment rate show that non-acquirers invest more in new tangible fixed assets. Yet, this difference is only statistically significant according to a parametric t-test.

We do not separately report the industry and aggregate market variables for the two samples, as these are the same due to our matching procedure. First, we observe that the average size of industry incumbents (6.55) is comparable to that of non-acquiring firms (5.87), indicating that our random selection procedure has worked properly. Next, the average industry has a HH-concentration index of only 16.32% and grows by 5.26% per annum. The average volume of M&As relative to the total number of M&As equals 12.63%. The return on the Belgian All Shares Index averages to 10.47% per annum during 1997–2005, with a standard deviation of 23.31%. GDP grows by 2.24% on average and the average yield spread equals 1.09% whereas the average term spread equals 1.21%.

<insert Tables 5-6>

4. Results

In this section, we discuss the results of various logit regression analyses. We first examine the entire sample of acquiring and matching firms. In a second step, we split the sample according to industry growth. Finally, we examine the choice between related and unrelated M&As.

4.1. Logit regression analysis on the entire sample

We estimate a logit regression model whereby the dependent variable is a binomial choice variable that equals one if the company grows through a merger or acquisition in a particular year and zero otherwise. A company and its matching firm are included only for the year of M&A in the analyses whereas the explanatory variables are lagged during one year.²⁰ A definition of the explanatory

²⁰ We also test the robustness of our results by estimating a model whereby the explanatory firm variables are calculated as the mean value over the past three years. The results from this robustness check (not reported in the text) show that

variables and the hypothesized sign of their relation with the probability of takeover was presented in Table 5. Table 7 reports the correlations between the different explanatory variables in our model. The pairwise correlation between stock market returns (BASI) and the yield spread equals -0.80, indicating that multicollinearity is likely to be a problem for these variables. Hence, we do not take up these two variables in the same regression model. The results of the logit regression models are presented in Table 8. Panel A of Table 8 reports the results when including EBITDA/total assets whereas the cash ratio is included in Panel B. In column 1 of each panel, we report the models without interaction terms between ownership concentration and EBITDA/total assets and the cash ratio, respectively. In column 2, we add these interaction terms. Column 3 of each panel shows the results of the model without the quadratic terms of industry concentration and industry growth. In column 4 we report the results of the models without ownership concentration because this variable is only known for 435 out of the 585 acquiring firms in our sample.

<insert Tables 5–6>

The results in Table 8 show that the ratio of intangible to total assets is significantly positively related to the probability of growing through an M&A, supporting the hypothesis that synergy benefits from transferring knowledge and technology to another firm are an important motive underlying mergers and acquisitions. This conclusion is consistent with the findings of Lehto and Lehtoranta (2004).

We do not find any significant relation with internal cash flow generation, proxied by EBITDA/total assets, nor with the available cash reserves, measured by the cash ratio. So, in contrast to Harford (1999), we do not find that cash-rich firms are more probable to initiate M&As. Furthermore, the coefficients on the interaction terms with ownership concentration are neither significant, suggesting that agency problems are not the main driving factor behind the M&As of firms with large internal cash flows. This finding may not be too surprising, given that the descriptive statistics already showed a rather high ownership concentration in our sample and,

most of our conclusions are indeed robust, except for the ratio of intangible assets to total assets which becomes insignificant and the bank debt variable which becomes only borderline significant (*p-value* of approximately 0.10).

hence, indicating that shareholders have a large interest in monitoring firm management. Yet, the data do show that firms with a higher ownership concentration tend to engage less in mergers and acquisitions. Although a negative coefficient could indicate that shareholders of closely held firms may temper agency problems of equity by effectively monitoring the firm's management, our findings likely indicate that firms with a highly concentrated ownership structure care more about preserving control and hence may find it difficult to finance their M&As.

The results further show that the debt/assets ratio is significantly positively related to external growth in column 1 of Panel A. This is inconsistent with the findings of Hay and Liu (1998) and contradicts the predictions of Jensen's free cash flow theory (1986). Yet, a positive relation may not be too surprising, given that we already documented earlier that agency problems are not a major driving force behind the M&As in our sample. Then, a positive coefficient may result when companies with high leverage are able and willing to issue stock as compensation for their M&As (stock swap).

The significantly negative coefficient on the bank debt mix variable is consistent with the bank monitoring idea. Yet, as agency problems are not a major driving force behind the M&As in our sample, a negative coefficient on the portion of bank loans variable could also indicate that the obligation to make interest payments and repay the loan principal limits the possibility to finance M&As while simultaneously bank loan covenants could constrain external growth decisions. Furthermore, firms with a high proportion of bank loans may follow more conservative external growth decisions. Again consistent with the lack of agency problems in our sample, we find that the dividend payout dummy is significantly positively related to the decision to grow through M&As in columns 1 and 2 of Panel B.

Large firms are significantly more likely to become acquirers. This may indicate that large firms have a better potential for realizing synergies. Furthermore, large firms often have – or can more easily collect – the resources needed to acquire other companies.²¹ Remarkably, the variable

²¹ These conclusions also hold when using the log of total sales and the log of the number of employees as proxy for size in stead of the log of total assets.

capturing the minimum efficient scale in the industry is significantly negatively related to the probability of external growth. This may indicate that firms in industries with large players are not growing anymore or – alternatively – they may be relying more on internal growth. Finally, firms having the characteristics of acquirers could already be operating at their optimal scale in such industries.

Industry concentration is significantly negatively related to the probability of M&A (in columns 3 and 4) whereas the quadratic term in industry concentration is insignificant in all models. In other words, the likelihood of engaging in M&As decreases with industry concentration. This negative relation of industry concentration with external growth seems inconsistent with the market power hypothesis. However, to really reject this conjecture, we need to examine the relation of industry concentration in horizontal M&A decisions (see Section 4.3). Indeed, when firms are generating large internal free cash flows in highly concentrated industries, they may engage in diversifying M&As.

The relation between industry growth and M&A decisions is not significant in our sample, which contradicts previous findings by Andrade and Stafford (2004) and Powell and Yawson (2005). Consistent with the findings of Mitchell and Mulherin (1996) and Andrade *et al.* (2001), the data show that industry deregulation is an important factor determining M&A activity. In industries that experience a deregulation, M&As tend to occur more often, *ceteris paribus*. However, this relation is only significant when we estimate the model without the ownership concentration variable (column 4).

We do not find any evidence supporting the hubris and the under- or overvaluation hypothesis. Given the high ownership concentration in our sample, the latter is not surprising. Furthermore, we do not find a significant relation with real GDP growth nor with the term spread.²²

²² These conclusions do not change when we replace stock market returns by the yield spread in our model. Hence, we do not report the models with the yield spread in the paper, but the results can be obtained from the authors upon request. Furthermore, the results are the same when using the total return on the Dow Jones Euro Stoxx Index instead of the Belgian All Shares Index, when including nominal rather than real GDP growth, or when using the yield difference on bonds with a modified duration of ten years instead of five years.

Overall, these results indicate that aggregate market conditions are not highly relevant in explaining M&A activity in our sample.

The results further demonstrate that internal growth is insignificantly related to the probability of M&A. This could indicate that internal and external growth are independent growth strategies.²³

<insert Table 8>

4.2. Low- versus high-growth industries

Table 9 provides the results of the logit regression analyses on two other subsamples. The first subsample consists of the bidders and their corresponding matching firms from the industries with the 25% lowest sales growth rate (Panel A). The second subsample consists of the firms from the industries that are in the 25% highest growth percentile (Panel B).^{24, 25} The results in table 9 show that the decision to grow through M&As may be driven by different factors depending on whether the bidder operates in high- or low-growth industries.

Whereas leverage is significantly positively related to the probability of external growth in the entire sample, the debt ratio is no longer significant in the subsample of low-growth industries and becomes significantly negative in the subsample of high-growth industries (column 3). This indicates that being financially constrained, due to high debt, reduces the probability of external growth in high-growth industries. As companies in high-growth industries have many investment opportunities, the access to financial resources may be especially important for these companies. Further, the fact that profitability and cash reserves are insignificant in explaining M&As in the low-growth subsample again confirms that agency problems of equity are not an important driver underlying M&A in our sample as Jensen (1986) points out that agency problems of free cash flow

²³ This also holds when we estimate the model for companies that made M&As in only one year during the sample period. In this sample, the investment rate is not influenced by external growth. Furthermore, this conclusion is not affected when we replace the investment rate by an interaction term between the investment rate and (1–debt ratio) and a quotation dummy, respectively.

²⁴ When we use the 33th percentile instead of the 25th percentile, we find the same results and conclusions. The results from this robustness check are obtainable from the authors upon request.

²⁵ The pairwise correlation between stock market returns and the yield spread also exceeds 0.7 in absolute value in these subsamples. Hence, to avoid multicollinearity problems, we estimate the subsample models with stock market returns and with the yield spread separately.

should be important especially for firms with limited growth prospects. In addition, the positive coefficient on the pay-out dummy in the subsample of low-growth industries is also inconsistent with the agency theory. Next, ownership concentration is only significant in low-growth industries, indicating that shareholders of companies in high-growth industries may care less about preserving control. The data further show that large firms with little bank debt but a lot of intangible capital are more likely to be acquirers in both subsamples. These conclusions are consistent with the findings for the entire sample.

Regarding the industry variables, there are also some important differences between low- and high-growth industries. Industry concentration and the scale of industry incumbents are only significant in explaining M&As in high-growth industries. Deregulation, on the other hand, seems only to matter in low-growth industries. This result may not be too surprising, given that only four out of the 28 companies in industries being deregulated are included in the high-growth subsample. Finally, there is some evidence that GDP growth significantly negatively affect the M&A decision of companies in low-growth industries (column 3). This finding is consistent with the bankruptcy avoidance theory, suggesting that companies with limited growth opportunities may need to combine in bad economic periods in order to survive.

<insert Table 9>

4.3. Related versus unrelated growth

Motives underlying external expansion in a related business could be very different from those behind unrelated or diversifying mergers and acquisitions. Table 10 reports the results of a logit regression analysis for the sample of firms that grow through a M&A (no matching is done here). The dependent variable related equals one when the bidder engaged in an M&A where the target is from the same four-digit SIC industry.²⁶ If the bidder initiated various M&As in the same year, we

²⁶ As a robustness check we have also used the two-digit SIC codes to classify the mergers and acquisitions but most conclusions are identical.

set the dependent variable equal to one when at least one of the target firms is from the same industry.²⁷ The explanatory variables are the same as those in the above regression models.

The negative coefficient on the intangible assets variable suggests that the transfer of knowledge and technology to a target firm is a more important motive underlying diversifying than related mergers and acquisitions. This may result when firms in the same industry possess highly comparable intangible assets, which makes it less worthwhile to engage in M&As in order to transfer this capital to other firms. Conversely, complementary R&D efforts among firms from various industries could pay off more, creating a huge potential for realizing synergies by transferring knowledge to one another. The latter may result, for example, when unrelated M&As are largely the result of vertical integration. Indeed, vertical integration is likely to be interesting especially if the acquiring company has high technical requirements vis-à-vis its suppliers because of its own high-tech production standards.

The results further show that EBITDA/ASSETS and the interaction term between EBITDA/ASSETS and ownership concentration are not significant in explaining the relatedness of M&As. This finding again indicates that agency problems of equity are not supported by our data, as the existence of managerial incentive problems would imply that managers in firms with large free cash flows and low ownership concentration would largely pursue diversifying M&As.

The data further show that highly levered, dividend-paying companies tend to engage in related mergers and acquisitions. The positive coefficient on the debt ratio is inconsistent with the financial synergy hypothesis, which conjecture that especially highly leveraged firms may seek to reduce their systematic risk and realize a lower cost of capital by diversifying their operations.

Large firms are more likely to initiate diversifying M&As. This may indicate that larger companies may have to look outside their own industry to fill their appetite for external growth, given that we already documented that firm size is significantly positively related to the likelihood

²⁷ Alternatively, we have set the dummy variable equal to one when all target firms are from the same four-digit SIC industry in case the bidder was involved in multiple M&As in a particular year. The results are robust under this alternative definition of related growth.

of M&A. Consistent with this size effect, we also find that diversifying M&As are significantly more likely in industries where incumbents are already operating at a relatively high scale.

One of the most cited rationales behind horizontal mergers and acquisitions is the benefit of realizing monopoly returns by increasing firm market power. Our results indicate that related M&As indeed tend to occur in more highly concentrated industries. Yet, the quadratic term in industry concentration is significantly negative, which indicates that from a certain level of concentration (34.88% in the first regression model), further consolidation in the same industry is more difficult to achieve. Industry growth, on the other hand, bears an U-shaped relation with the likelihood of engaging in a related M&A, indicating that companies are less likely to grow through related M&As when their industry growth is high, up till a certain level (12.52% in the first regression model). This suggests that companies in low-growth industries are more likely to consolidate in their own industries, which is consistent with the bankruptcy avoidance theory. This is also supported by the negative coefficient on the Belgian All Shares Index, suggesting that related M&As are more likely to take place in periods of low stock prices.

The above conclusions are robust when replacing stock market returns with the yield spread.

<insert Table 10>

5. Conclusions

This paper empirically investigates the determinants of growth through mergers and acquisitions. For this purpose, we use data on 378 Belgian firms that grow through M&As during 1997–2005 and match this sample with companies that did not pursue external growth.

Our results do not support the hypothesis that realizing operating synergies by means of scale economies is an important determinant underlying external growth as the minimum efficient scale in an industry is significantly negatively related to the decision to grow through M&A. However, we do find support for the transfer of intangible capital as a principal motive behind M&As. Furthermore, this motive is found to be important particularly in diversifying M&As,

where bidder and target could benefit from complementary knowledge and technologies, such as in vertically integrating M&As. Next, we do not find any evidence supporting the financial synergy hypothesis.

Our results also support the market power hypothesis because related mergers and acquisitions are more likely to take place in more highly concentrated industries. However, from a certain level of concentration, further consolidation in the same industry is more difficult to achieve. Furthermore, the results are consistent with the bankruptcy avoidance theory as companies in low-growth industries are more likely to consolidate in their own industries. Besides, we find that industry deregulation significantly positively influences the M&A decision, consistent with the idea that M&A can be used to realize industry restructuring after deregulation.

We do not find any support for agency problems or hubris underlying M&As in our sample of typical Continental European companies, where ownership is highly concentrated even for companies with limited growth opportunities.

Overall, our study contributes to the literature as it provides an empirical test of the most widely cited motives in the theoretical M&A literature. We provide evidence on the motives that are important for mergers and acquisitions in a Continental European setting. Furthermore, our findings on the drivers of M&As may give some indications about potential sources of value creation in &As. Our results show which firm characteristics, industry and market variables should be further investigated when examining short- and long-term stock returns and operational performance after mergers and acquisitions, especially in Continental European countries. Hence, our findings may also explain why bidder announcement returns are found to be higher for Continental European acquirers than for those in Anglo-Saxon countries.

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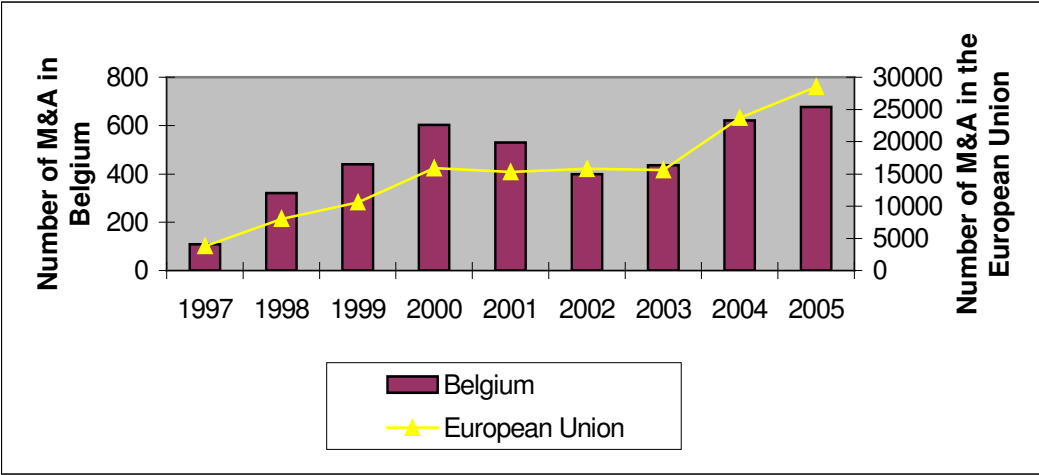
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Figure 1: M&A activity in Belgium and in the European Union



Source: The Zephyr database

Table 1: Deal status

Deal status	Number of transactions	
Completed	728	79.30%
Announced	155	16.88%
Withdrawn	9	0.98%
Pending	25	2.72%
Unconditional	1	0.11%
Total sample	918	100%

Table 2: Type of transaction

Type of transaction		Number of transactions	
Acquisition	New shareholder takes over control	785	85.51%
	Acquisition increased from $\leq 20\%$ to $\geq 50\%$	3	0.33%
	Acquisition increased from $> 20\%$ and $< 50\%$ to $\geq 50\%$	16	1.74%
	Acquisition increased from $\geq 50\%$ to $> 50\%$	85	9.26%
Merger	New shareholder	29	3.16%
Total sample		918	100%

Table 3: Industry distribution of the acquiring firms

This table provides an overview of the industry distribution of the 638 observations of acquiring firms at the two-digit SIC level.

SIC code	Industry	Number of observations
02	Agricultural production crops	1
10	Metal mining	1
12	Coal mining	1
14	Nonmetallic minerals, except fuels	2
15	General building contractors	7
16	Heavy construction, ex. building	8
17	Special trade contractors	10
20	Food and kindred products	45
22	Textile mill products	11
24	Lumber and wood products	4
25	Furniture and fixtures	3
26	Paper and allied products	9
27	Printing and publishing	39
28	Chemicals and allied products	26
29	Petroleum and coal products	4
30	Rubber and misc. plastic products	11
32	Stone, clay and glass products	11
33	Primary metal industries	20
34	Fabricated metal products	9
35	Industrial machinery and equipment	14
36	Electronic & other electronic equipment	20
37	Transportation equipment	3
38	Instruments and related products	1
39	Miscellaneous manufacturing industries	8
40	Railroad transportation	2
41	Local and interurban passenger transit	3
42	Trucking and warehousing	15
44	Water transportation	7
45	Transportation by air	2
47	Transportation services	8
48	Communication	12
49	Electric, gas and sanitary services	1
50	Wholesale trade-durable goods	36
51	Wholesale trade-nondurable goods	36
52	Building materials & garden supplies	1
53	General merchandise stores	2
54	Food stores	8
56	Apparel and accessory stores	4
57	Furniture and homefurnishing stores	4
58	Eating and drinking places	4
59	Miscellaneous retail	10
72	Personal services	11
73	Business services	77
78	Motion pictures	6
79	Amusement & recreation services	2
80	Health services	5
81	Legal services	4
87	Engineering & management services	55
91	Executive, legislative, and general	1
96	Administration of economic programs	1
TOTAL		585

Table 4: An overview of the M&A transactions in our sample period

This table provides an overview of the distribution of M&A transactions during the sampling period and the method of payment. The information on the method of payment is based on data of 134 transactions.

Year	Number of firms	Number of transactions	% Cash	% Cash (public bidders)	% Cash (private bidders)
1997	10	13	NA	NA	NA
1998	48	61	50,00%	100,00%	33,33%
1999	42	62	36,36%	16,67%	60,00%
2000	65	113	36,00%	27,27%	100,00%
2001	64	99	42,11%	38,46%	50,00%
2002	60	97	60,00%	53,33%	80,00%
2003	95	117	73,68%	55,56%	90,00%
2004	95	124	57,14%	50,00%	71,43%
2005	106	130	73,33%	87,50%	57,14%
Total	585	816	53.58%	53,60%	67,74%

Table 5: An overview of the explanatory variables used in the logit regression model

This table presents the definition of the explanatory variables and the hypothesized sign of the relation with the probability of takeover.

Variable	Definition	Hypothesized sign
Synergies		
SCALE ECONOMIES	Median of the natural logarithm of total assets of firms older than ten years in the corresponding four-digit SIC industry	+
FIRM SIZE	Natural logarithm of total assets	+
INTANGIBLES/ASSETS	Intangible assets minus goodwill / Total assets	+
Market power		
INDUSTRY CONCENTRATION	Herfindahl-Hirschman index (the sum of the squares of the market shares of each firm in the corresponding industry)	-
Industry shocks		
INDUSTRY GROWTH	Growth rate of sales in the corresponding industry	?
DEREGULATION	Dummy that equals one if the corresponding industry has been deregulated and zero otherwise	+
GDP GROWTH	Growth rate of gross domestic product at constant prices (real GDP growth rate)	+
Agency problems		
EBITDA/ASSETS	Earnings before interest, taxes, depreciation and amortization / Total assets	+
CASH RATIO	Cash and cash equivalents / Total assets	+
OWNERSHIP CONCENTRATION	Sum of the squares of the percentage of the shares owned by each shareholder	-
DEBT RATIO	Total debt / Total assets	-
BANK LOANS/DEBT	Bank loans / Total debt	-
PAYOUT DUMMY	Dummy that equals one if the company pays out a dividend to its shareholders and zero otherwise	-
Hubris		
M&A VOLUME	Number of M&As in a particular year relative to the total number of M&As during the sampling period (reported in the Zephyr database)	+
Under-valuation/over-valuation		
BASI	Return on the Belgian All Shares total return index	?
YIELD SPREAD	Difference between the average yield on European corporate bonds with rating BBB and the average yield on European government bonds (both with a modified duration of five years)	+
TERM SPREAD	Difference between the average yield on Belgian government bonds with a modified duration of five years and the yield on a Belgian Treasury Note with a maturity of three months	+
External versus internal investment		
INVESTMENT RATE	New tangible fixed assets / Total assets	?

Table 6: Summary statistics

In this table, we report the mean, median and standard deviation of the firm characteristics, industry and aggregate market variables for the M&A firms (Y=1) and their matching counterparts (Y=0). For each firm characteristic, we also report the *p*-value of a parametric t-test and a non-parametric Wilcoxon signed-rank test that compares companies that grow through a merger or acquisition in a particular year with companies that did not grow through M&A.

	Y=1			Y=0			t-test	Wilcoxon test
Firm characteristics	<i>Mean</i>	<i>Median</i>	<i>Std. Dev.</i>	<i>Mean</i>	<i>Median</i>	<i>Std. Dev.</i>	<i>p-value</i>	<i>p-value</i>
INTANGIBLES/ASSETS	0.0143	0.0015	0.0258	0.0064	0.0000	0.0204	0.0000	0.0000
EBITDA/ASSETS	0.1027	0.0967	0.1082	0.1164	0.1006	0.1361	0.0569	0.2006
CASH RATIO	0.1027	0.0531	0.1336	0.1731	0.0930	0.1932	0.0000	0.0000
OWNERSHIP CONCENTRATION	0.4908	0.3741	0.3830	0.9554	1.0000	0.1819	0.0000	0.0000
DEBT RATIO	0.6020	0.6252	0.2575	0.6089	0.6424	0.3130	0.6784	0.4349
BANK LOANS/DEBT	0.4137	0.4127	0.2995	0.3039	0.2226	0.3083	0.0000	0.0000
PAYOUT DUMMY	0.4547	0.0000	0.4984	0.1128	0.0000	0.3166	0.0000	0.0000
FIRM SIZE	10.5361	10.8337	2.4045	5.8682	5.6276	1.8682	0.0000	0.0000
INVESTMENT RATE	0.0447	0.0249	0.0589	0.0588	0.0250	0.0785	0.0033	0.6094
	Total sample							
Industry variables	<i>Mean</i>	<i>Median</i>	<i>Std. Dev.</i>					
SCALE ECONOMIES	6.5472	6.3244	1.0598					
INDUSTRY CONCENTRATION	0.1632	0.0928	0.1737					
INDUSTRY GROWTH	0.0526	0.0425	0.1688					
DEREGULATION	0.0239	0.0000	0.1530					
Market variables	<i>Mean</i>	<i>Median</i>	<i>Std. Dev.</i>					
M&A VOLUME	0.1263	0.1233	0.0413					
BASI	0.1047	0.1601	0.2331					
GDP GROWTH	0.0224	0.0168	0.0111					
YIELD SPREAD	0.0109	0.0127	0.0056					
TERM SPREAD	0.0121	0.0114	0.0049					

Table 7: Correlation Matrix

This table provides the pairwise correlations between the different explanatory variables used in the logit regression analysis.

	FIRM SIZE	INTANGIBLES/ASSETS	OWNERSHIP CONCENTRATION	EBITDA/ASSETS	CASH RATIO	DEBT RATIO	BANK LOANS/DEBT	PAYOUT RATIO	INVESTMENT RATE	SCALE ECONOMIES	INDUSTRY GROWTH	IND. CONCENTRATION	DEREGULATION	M&A VOLUME	BASI	GDP GROWTH	YIELD SPREAD	TERM SPREAD
FIRM SIZE	1.0000	0.1440	-0.5762	-0.0517	-0.2965	-0.0831	0.2923	0.5143	-0.1637	0.2439	0.0033	0.2042	0.0182	-0.0130	-0.0183	0.0332	-0.0065	-0.0554
INTANGIBLES/ASSETS	0.1440	1.0000	-0.2229	-0.0046	-0.0546	0.0192	0.0251	0.0768	-0.0170	-0.0086	-0.0956	-0.0001	0.0717	0.0522	-0.0557	-0.0574	0.0834	0.0112
OWNERSHIP CONCENTRATION	-0.5762	-0.2229	1.0000	-0.0078	0.1239	0.1371	-0.1941	-0.3897	0.1057	-0.0641	0.0228	-0.0701	-0.0029	0.0935	0.0102	-0.0315	0.0557	0.0090
EBITDA/ASSETS	-0.0517	-0.0046	-0.0078	1.0000	0.0739	-0.0798	0.0664	0.2417	0.1526	0.0523	0.0070	-0.0221	0.0351	-0.0325	0.0576	0.0111	-0.0480	0.0008
CASH RATIO	-0.2965	-0.0546	0.1239	0.0739	1.0000	-0.2324	-0.4467	-0.1387	-0.0599	-0.0737	-0.0201	-0.0725	0.0067	0.0152	-0.0055	-0.0076	0.0036	0.0155
DEBT RATIO	-0.0831	0.0192	0.1371	-0.0798	-0.2324	1.0000	0.0853	-0.1453	0.1336	-0.0722	0.0380	-0.0766	-0.0236	0.1239	-0.0156	-0.0312	0.0807	0.0169
BANK LOANS/DEBT	0.2923	0.0251	-0.1941	0.0664	-0.4467	0.0853	1.0000	0.1349	0.0863	0.0641	-0.0053	0.0721	-0.0206	-0.0784	0.0318	0.0179	-0.0711	0.0050
PAYOUT DUMMY	0.5143	0.0768	-0.3897	0.2417	-0.1387	-0.1453	0.1349	1.0000	-0.0233	0.1487	-0.0223	0.1317	0.0006	-0.1057	0.0450	0.0357	-0.1024	-0.0066
INVESTMENT RATE	-0.1637	-0.0170	0.1057	0.1526	-0.0599	0.1336	0.0863	-0.0233	1.0000	-0.0517	-0.0100	-0.0244	0.0366	0.0023	0.0390	0.0413	-0.0457	-0.0014
SCALE ECONOMIES	0.2439	-0.0086	-0.0641	0.0523	-0.0737	-0.0722	0.0641	0.1487	-0.0517	1.0000	-0.0013	0.4143	0.3029	-0.0206	-0.0168	0.0059	0.0059	-0.0846
INDUSTRY GROWTH	0.0033	-0.0956	0.0228	0.0070	-0.0201	0.0380	-0.0053	-0.0223	-0.0100	-0.0013	1.0000	0.1621	-0.1561	0.0292	0.0515	0.0900	-0.0660	-0.1611
IND. CONCENTRATION	0.2042	-0.0001	-0.0701	-0.0221	-0.0725	-0.0766	0.0721	0.1317	-0.0244	0.4143	0.1621	1.0000	0.1207	-0.0555	-0.0638	-0.0006	0.0089	-0.0808
DEREGULATION	0.0182	0.0717	-0.0029	0.0351	0.0067	-0.0236	-0.0206	0.0006	0.0366	0.3029	-0.1561	0.1207	1.0000	-0.0311	0.0182	0.0150	-0.0382	-0.0420
M&A VOLUME	-0.0130	0.0522	0.0935	-0.0325	0.0152	0.1239	-0.0784	-0.1057	0.0023	-0.0206	0.0292	-0.0555	-0.0311	1.0000	-0.1076	0.1155	0.5114	-0.2251
BASI	-0.0183	-0.0557	0.0102	0.0576	-0.0055	-0.0156	0.0318	0.0450	0.0390	-0.0168	0.0515	-0.0638	0.0182	-0.1076	1.0000	0.1889	-0.7976	0.0076
GDP GROWTH	0.0332	-0.0574	-0.0315	0.0111	-0.0076	-0.0312	0.0179	0.0357	0.0413	0.0059	0.0900	-0.0006	0.0150	0.1155	0.1889	1.0000	-0.4647	-0.3884
YIELD SPREAD	-0.0065	0.0834	0.0557	-0.0480	0.0036	0.0807	-0.0711	-0.1024	-0.0457	0.0059	-0.0660	0.0089	-0.0382	0.5114	-0.7976	-0.4647	1.0000	-0.0204
TERM SPREAD	-0.0554	0.0112	0.0090	0.0008	0.0155	0.0169	0.0050	-0.0066	-0.0014	-0.0846	-0.1611	-0.0808	-0.0420	-0.2251	0.0076	-0.3884	-0.0204	1.0000

Table 8 (Panel A): Logit Regression Results on the M&A Decision

The dependent variable equals one if the company grows through M&A in a particular year and zero otherwise. A company and its matching firm are included in the analyses only for the year of M&A. A definition of the explanatory variables and the hypothesized sign of their relation with the probability of takeover is presented in Table 5.

Variable	(1)		(2)		(3)		(4)	
	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>
C	-4.7999	0.0118	-5.2434	0.0066	-5.0297	0.0082	-4.2526	0.0016
INTANGIBLES/ASSETS	31.4686	0.0002	31.9543	0.0001	31.5603	0.0001	26.8061	0.0000
EBITDA/ASSETS	0.3706	0.8402	4.5835	0.2505	4.6947	0.2368	0.4155	0.7337
EBITDA/ASSETS * OWNERSHIP CONCENTRATION			-5.5238	0.2373	-5.6863	0.2211		
CASH RATIO								
CASH RATIO * OWNERSHIP CONCENTRATION								
OWNERSHIP CONCENTRATION	-2.8428	0.0000	-2.2401	0.0012	-2.2000	0.0014		
DEBT RATIO	1.2935	0.0881	1.2254	0.1029	1.2189	0.1008	0.5513	0.2837
BANK LOANS/DEBT	-1.4101	0.0474	-1.3905	0.0521	-1.3697	0.0562	-0.7875	0.1017
PAYOUT DUMMY	0.7216	0.1195	0.7216	0.1239	0.6682	0.1491	0.2880	0.4111
FIRM SIZE	1.3332	0.0000	1.3405	0.0000	1.3414	0.0000	1.2504	0.0000
INVESTMENT RATE	0.5741	0.8251	0.5318	0.8393	0.3887	0.8815	1.3370	0.4622
SCALE ECONOMIES	-0.7329	0.0018	-0.7373	0.0017	-0.7924	0.0003	-0.8663	0.0000
INDUSTRY CONCENTRATION	-5.9048	0.1447	-5.7908	0.1558	-3.1307	0.0175	-5.5356	0.0585
INDUSTRY CONCENTRATION ²	5.0526	0.4501	4.5742	0.4990			4.2748	0.3730
INDUSTRY GROWTH	-0.9820	0.3776	-1.0320	0.3575	-0.9574	0.3728	-0.6737	0.4552
INDUSTRY GROWTH ²	0.6046	0.8807	0.7659	0.8501			0.1864	0.9529
DEREGULATION	1.5589	0.2148	1.7484	0.1737	1.8449	0.1565	2.8016	0.0034
M&A VOLUME	3.6579	0.4214	3.9475	0.3903	3.8433	0.4027	1.0257	0.7491
BASI	-0.1291	0.8697	-0.1407	0.8584	-0.1181	0.8805	-0.0697	0.9037
GDP GROWTH	-3.8260	0.8367	-5.0867	0.7859	-5.0228	0.7882	-14.5102	0.2774
TERM SPREAD	-10.8784	0.8027	-12.5252	0.7758	-13.0551	0.7588	18.0344	0.5703
McFadden R-squared		0.7728		0.7742		0.7737		0.6488

Table 8 (Panel B): Logit Regression Results on the M&A Decision

Variable	(1)		(2)		(3)		(4)	
	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value
C	-4.2315	0.0298	-4.2525	0.0298	-3.9992	0.0371	-3.9909	0.0048
INTANGIBLES/ASSETS	31.6582	0.0002	31.5538	0.0002	31.2028	0.0002	26.7570	0.0000
EBITDA/ASSETS								
EBITDA/ASSETS * OWNERSHIP CONCENTRATION								
CASH RATIO	-1.6966	0.2965	-1.3352	0.7158	-1.4708	0.6848	-0.4232	0.6775
CASH RATIO * OWNERSHIP CONCENTRATION			-0.4821	0.9123	-0.3878	0.9289		
OWNERSHIP CONCENTRATION	-2.8121	0.0000	-2.7708	0.0000	-2.7566	0.0000		
DEBT RATIO	1.0201	0.1984	1.0158	0.2010	0.9972	0.2047	0.4319	0.4328
BANK LOANS/DEBT	-1.5431	0.0325	-1.5415	0.0326	-1.5285	0.0348	-0.8214	0.0981
PAYOUT DUMMY	0.7584	0.0892	0.7559	0.0907	0.7035	0.1105	0.3200	0.3383
FIRM SIZE	1.3129	0.0000	1.3114	0.0000	1.3111	0.0000	1.2393	0.0000
INVESTMENT RATE	0.5398	0.8315	0.5286	0.8349	0.3582	0.8869	1.4091	0.4339
SCALE ECONOMIES	-0.7298	0.0017	-0.7276	0.0019	-0.7836	0.0003	-0.8639	0.0000
INDUSTRY CONCENTRATION	-5.8877	0.1466	-5.8952	0.1461	-3.1781	0.0145	-5.5805	0.0568
INDUSTRY CONCENTRATION ²	4.6473	0.4882	4.6644	0.4868			4.3224	0.3680
INDUSTRY GROWTH	-1.0172	0.3582	-1.0232	0.3559	-0.9498	0.3706	-0.6734	0.4540
INDUSTRY GROWTH ²	0.6815	0.8660	0.6907	0.8643			0.2350	0.9406
DEREGULATION	1.7623	0.1653	1.7171	0.1981	1.8277	0.1765	2.8234	0.0033
M&A VOLUME	3.8422	0.3952	3.8126	0.3994	3.7046	0.4122	1.0796	0.7355
BASI	-0.0765	0.9224	-0.0719	0.9272	-0.0469	0.9522	-0.0725	0.9000
GDP GROWTH	-5.1055	0.7832	-4.9631	0.7896	-4.9027	0.7917	-15.0343	0.2620
TERM SPREAD	-11.9162	0.7850	-12.5131	0.7762	-12.5120	0.7686	17.4556	0.5849
McFadden R-squared		0.7739		0.7739		0.7734		0.6489

Table 9 (Panel A): Logit Regression Analysis on the M&A Decision for the Subsample of Low-growth Industries

The dependent variable equals one if the company grows through M&A in a particular year and zero otherwise. A company and its matching firm are included in the analyses only for the year of M&A. A definition of the explanatory variables and the hypothesized sign of their relation with the probability of takeover is presented in Table 5. We estimate the models for companies that are in the 25% lowest growth percentile (Panel A) and for companies that are in the 25% highest growth percentile (Panel B).

Variable	(1)		(2)		(3)		(4)	
	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value
C	-3.0991	0.5812	-5.7391	0.0374	-1.5637	0.7970	-5.3009	0.0712
INTANGIBLES/ASSETS	29.0564	0.0719	20.7436	0.0352	32.9321	0.0607	20.5192	0.0379
EBITDA/ASSETS	6.8681	0.4339	1.7592	0.4326				
EBITDA/ASSETS * OWNERSHIP CONCENTRATION	-10.4347	0.3760						
CASH RATIO					-3.4190	0.6974	-0.1678	0.9299
CASH RATIO * OWNERSHIP CONCENTRATION					5.9235	0.5686		
OWNERSHIP CONCENTRATION	-5.1302	0.0132			-6.8818	0.0011		
DEBT RATIO	2.9214	0.1866	0.8961	0.3957	2.9666	0.1792	0.7926	0.4736
BANK LOANS/DEBT	-1.0950	0.5643	-2.0444	0.0505	-1.2538	0.4849	-1.8110	0.0813
PAYOUT DUMMY	2.2014	0.0837	-0.2649	0.7155	2.1141	0.0774	-0.0693	0.9174
FIRM SIZE	1.4785	0.0000	1.2889	0.0000	1.5280	0.0000	1.2502	0.0000
INVESTMENT RATE	5.2510	0.4628	-0.0368	0.9921	5.1426	0.4918	-0.1382	0.9709
SCALE ECONOMIES	-0.8277	0.1427	-0.4354	0.1773	-0.8969	0.1232	-0.4590	0.1533
INDUSTRY CONCENTRATION	-4.7477	0.6481	-4.2446	0.4860	-6.9960	0.4605	-3.5243	0.5525
INDUSTRY CONCENTRATION ²	0.5638	0.9755	-1.9347	0.8512	5.5225	0.7278	-3.2749	0.7441
DEREGULATION	2.0697	0.4024	2.8947	0.0274	2.3603	0.4263	2.9933	0.0256
M&A VOLUME	20.8102	0.2553	-5.8342	0.4237	21.6446	0.2687	-5.5283	0.4490
BASI	0.3951	0.8598	-0.7095	0.5718	0.3758	0.8717	-0.5639	0.6501
GDP GROWTH	-110.4794	0.1035	-8.2985	0.7890	-122.8790	0.0999	-11.6549	0.7059
YIELD SPREAD	-193.6782	0.1508	5.1381	0.9417	-195.8214	0.1470	13.8116	0.8429
McFadden R-squared		0.8263		0.6476		0.8249		0.6455

Table 9 (Panel B): Logit Regression Analysis on the M&A Decision for the Subsample of High-growth Industries

Variable	(1)		(2)		(3)		(4)	
	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>
C	-6.1766	0.1119	-5.6780	0.0432	-4.0242	0.2934	-5.4507	0.0660
INTANGIBLES/ASSETS	35.6816	0.1199	24.2584	0.1393	54.6110	0.0316	29.3681	0.0465
EBITDA/ASSETS	16.8658	0.2634	2.5207	0.4506				
EBITDA/ASSETS * OWNERSHIP CONCENTRATION	-12.0277	0.4280						
CASH RATIO					16.8619	0.2549	0.0718	0.9744
CASH RATIO * OWNERSHIP CONCENTRATION					-22.8568	0.1494		
OWNERSHIP CONCENTRATION	-1.9762	0.3039			-2.0706	0.1164		
DEBT RATIO	-1.0820	0.5549	-1.1812	0.3153	-3.3102	0.0912	-1.4940	0.2196
BANK LOANS/DEBT	-2.4570	0.1814	-2.1799	0.0897	-3.7289	0.0878	-2.1307	0.1259
PAYOUT DUMMY	-0.2517	0.8478	0.7471	0.3816	-0.2646	0.8451	0.9396	0.2492
FIRM SIZE	1.6114	0.0000	1.4012	0.0000	1.6266	0.0000	1.3668	0.0000
INVESTMENT RATE	1.6752	0.7749	2.3059	0.5881	5.6575	0.3817	3.0369	0.4637
SCALE ECONOMIES	-0.8164	0.1652	-0.6934	0.0512	-0.7799	0.1747	-0.6612	0.0583
INDUSTRY CONCENTRATION	-11.9954	0.3034	-12.5126	0.0986	-12.9129	0.2795	-12.4577	0.0976
INDUSTRY CONCENTRATION ²	15.2466	0.3825	14.5896	0.1840	13.9498	0.4355	14.6296	0.1791
DEREGULATION	-1.2887	0.7689	-1.3196	0.7213	-1.5670	0.7302	-1.5084	0.7077
M&A VOLUME	4.4498	0.6873	8.6219	0.2785	-1.0838	0.9222	8.8896	0.2635
BASI	0.1810	0.9237	-0.5292	0.6988	1.0796	0.5465	-0.3103	0.8160
GDP GROWTH	-8.5315	0.8576	-34.5701	0.2738	17.9068	0.7063	-31.7866	0.3081
YIELD SPREAD	39.8848	0.6835	65.8872	0.3187	65.7172	0.4884	70.5287	0.2839
McFadden R-squared		0.7844		0.6715		0.7909		0.6694

Table 10: Related versus Unrelated Growth

The dependent variable equals one when the bidder engaged in an M&A with a target from the same four-digit industry. If the bidder initiated various M&A, we set the dependent variable equal to one when at least one of the target firms is from the same industry. The explanatory variables are the same as in the above regression models.

Variable	(1)		(2)		(3)		(4)	
	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>
C	-0.6272	0.6795	-0.8065	0.6020	-0.6168	0.6908	-0.5859	0.7070
INTANGIBLES/ASSETS	-10.5203	0.0763	-10.4930	0.0757	-10.4239	0.0780	-10.4852	0.0773
EBITDA/ASSETS	0.3932	0.8060	1.6791	0.4891				
EBITDA/ASSETS * OWNERSHIP CONCENTRATION			-2.5191	0.4806				
CASH RATIO					0.1844	0.9070	-1.9501	0.3955
CASH RATIO * OWNERSHIP CONCENTRATION							4.7617	0.1672
OWNERSHIP CONCENTRATION	0.0183	0.9642	0.2925	0.6049	0.0178	0.9652	-0.3536	0.4729
DEBT RATIO	2.1404	0.0025	2.0627	0.0041	2.1239	0.0026	2.1181	0.0028
BANK LOANS/DEBT	0.6744	0.2165	0.6880	0.2082	0.7265	0.2628	0.6746	0.3025
PAYOUT DUMMY	0.5548	0.1132	0.5443	0.1209	0.5793	0.0834	0.5772	0.0863
FIRM SIZE	-0.1755	0.0557	-0.1759	0.0552	-0.1785	0.0506	-0.1652	0.0750
INVESTMENT RATE	1.1229	0.6627	1.3124	0.6126	1.2931	0.6021	1.4980	0.5460
SCALE ECONOMIES	-0.2755	0.0727	-0.2674	0.0821	-0.2718	0.0781	-0.2658	0.0835
INDUSTRY CONCENTRATION	8.8726	0.0041	9.0156	0.0036	8.9259	0.0038	8.8420	0.0040
INDUSTRY CONCENTRATION ²	-12.7182	0.0104	-12.9876	0.0091	-12.8106	0.0097	-12.9177	0.0090
INDUSTRY GROWTH	-1.5121	0.0936	-1.4949	0.0973	-1.4771	0.1024	-1.4310	0.1159
INDUSTRY GROWTH ²	6.0410	0.0416	5.9782	0.0440	5.9401	0.0432	5.9511	0.0440
DEREGULATION	-1.0312	0.4109	-1.1028	0.3769	-1.0476	0.4060	-1.0846	0.3889
M&A VOLUME	0.5311	0.8831	0.6515	0.8577	0.5133	0.8872	0.4627	0.8991
BASI	-1.2815	0.0442	-1.2753	0.0457	-1.2843	0.0449	-1.3863	0.0329
GDP GROWTH	12.6219	0.3675	11.8943	0.3968	12.1809	0.3803	11.6346	0.4027
TERM SPREAD	25.5524	0.4175	26.0448	0.4091	25.6587	0.4154	27.9715	0.3775
McFadden R-squared		0.1135		0.1149		0.1134		0.1186