VALUE CREATION MECHANISMS IN PRIVATE EQUITY

Agency Costs, Mentoring Effects, Asymmetric Information and Alleviation of Credit Constraints – a Comparison of Value Creation Mechanisms across Buyout Types

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Abstract

This thesis investigates the operational effect of leveraged buyouts (LBOs) on target companies in Sweden for buyouts occurring between 2006 and 2009. Combining theories of operational value creation in buyouts from previous research, hereunder agency theory and theories of parenting and mentoring effects, this thesis provides a more nuanced and detailed perspective on operational development in LBOs than most previous studies. In doing so, this thesis tests and further develops the credit constraint hypothesis of value creation in buyouts presented by Boucly et al. (2011). Previous research has generally, due to data constraints, either focused exclusively on public buyouts or not considered pre-buyout ownership at all. This thesis, however, provides strong indications that the operational impact of LBOs is highly conditional on pre-buyout ownership. For private targets, private equity ownership seems to facilitate further external financing through reducing credit constraints. This allows private targets to significantly outperform their peers in terms of growth in the post-buyout period. This effect seems to be even stronger in industries where credit constraints are of bigger concern. These results are in sharp contrast to most previous research, which has generally shown an increase in profitability and a decrease in investment following a buyout. Public, divisional and secondary buyouts, however, seem to be primarily focused on increasing profitability and efficiency in the post-buyout period, with no significant signs of abnormal growth on the preferred size variables. This is in line with most previous empirical research, as well as the most common theories of value creation in LBOs, which have identified reduced agency costs and mentoring effects as the primary generators of value in LBOs. The results in this thesis are highly relevant for future research, and highlight the importance of pre-buyout ownership in operational development after the buyout. In addition, even though the results in this study indicate that value redistribution between employees and the new owners seem to occur in public buyouts, there is no such indication for other types of buyouts. These results therefore also highly question the idea that returns generated in private equity are primarily based on redistribution, rather than creation, of value.

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1 Introduction

This paper examines operational development in private equity sponsored buyouts using a sample of 113 buyouts in Sweden in the period between 2006 and 2009. The objective of the paper is partly to conduct an out of sample test of various theories of operational value creation in buyouts. In doing so, it is also the objective to provide a richer and more nuanced analysis of the operational impact of buyouts than most previous studies have, especially previous studies conducted on the Swedish market.

The main reason why this study is important is that detailed empirical evidence on recent buyouts is relatively scarce. The scope of most empirical papers has been limited to public buyouts occurring during the 1980s (e.g. Kaplan, 1989; Lehn and Poulsen, 1989; Smith, 1990; Thompson and Wright, 1991). These early studies primarily test the so called incentive-intensity hypothesis, which states that agency costs that have arisen from the separation of management and control can be reduced by taking a public company private, particularly with a high level of debt (Liebeskind et al., 1992). Several studies of buyouts from this period show that incentive alignment measures such as managerial equity participation are commonly implemented in the post-buyout period (Muscarella and Vetsuypens, 1990; Baker and Montgomery, 1994). Most studies also show that target profitability tends to increase in the post-buyout period (e.g. Kaplan, 1989). Since then, agency theory has been the predominant framework through which operational development in LBO targets has been studied and explained, and only recently have other potential explanations for value creation in LBOs emerged (Berg and Gottschalg, 2004).

The prominence of the agency framework has provided valuable insight into causes and consequences of so called public-to-private buyouts. It has also lead to a general perception that buyouts is primarily a mechanism for streamlining inefficient public organizations through cost cutting and downsizing (Berg and Gottschalg, 2004). Furthermore, it has led to private equity sponsors have been criticized for generating returns through value redistribution from primarily employees, rather than through value creation (e.g. Drucker, 1986).

Strömberg (2008) has shown, however, that although public-to-private transactions constituted approximately 50% of total LBO transaction value in the 1980s, it now accounts for approximately 29% of the total value and only about 7% of the total number of transactions. In addition, it has been shown how LBOs can actually facilitate growth through increasing investment (Wright et al., 2001) and through alleviating credit constraints and providing access to external financing (Boucly et al., 2011). Strömberg (2008) provides evidence that the business model of private equity is no longer, to the same extent, based on targeting mature companies with high cash flow in declining industries. In contrast, buyouts take place in a wide range of industries and for companies in completely different stages of maturity (Ibid.). Therefore, it seems that the business model of private equity has broadened significantly since the 1980s, and research on this new business model in private equity has been relatively scarce.

The mechanisms through which non-public buyouts create value are not as widely researched as those through which public buyouts create value. Given the large dominance of private buyouts over public buyouts presented above and documented by Strömberg (2008), further research on this topic seems highly relevant. For example, family firms accounted for over 1/3 of European private equity targets in 2007 (Bruining et al., 2008), and this segment of buyouts is still not well understood (Cumming et al., 2007). Evidence has shown that ownership in private companies tend to be highly concentrated prior to buyouts, which indicates that these companies are not likely to suffer from the same type of agency problems as public corporations, and so the principal source of value creation in those buyouts is not likely to be a reduction of such agency costs (Chung, 2009). In addition, buyouts where the target is bought from another private equity sponsor, so called secondary buyouts, have become much more common since the 1980s (Strömberg, 2008). This is a quite natural development as the private equity market and the number of funds grows (Strömberg, 2008). This category of buyouts has not received as much attention as public buyouts either. This paper seeks to develop and test theoretically based hypotheses of how different types of buyouts may differ from each other and how they may be similar, with a special focus on whether operational development in the post-buyout period is related to pre-buyout ownership.

1.1 Research question

Based on previous theoretical and empirical research on different types of buyouts, this paper seeks to provide up to date empirical evidence on a deeper level of detail than most previous studies. In doing so, the goal is to provide an in depth answer to the following research questions:

a) How does private equity ownership affect the operational development of target companies relative to comparable non-target companies?
b) How does the impact of private equity ownership differ with respect to pre-buyout ownership, and other characteristics of the specific buyout?

These two research questions will be broken down into sub-questions and hypotheses in section 4. The various characteristics of the buyouts that will be studied will be discussed and explained in detail in section 5.

1.2 Structure of paper

The paper is organized as follows. Section 2 provides a short introduction to leveraged buyouts in general including a short overview of buyouts in the Swedish market. Section 3 reviews relevant literature, which is used to form a set of testable hypotheses in section 4. Section 5 describes the methodological approach and section 6 presents the empirical results. Alternative specifications and robustness checks are presented in section 7, and section 8 concludes on key results and implications for future research.

2 Private equity and leveraged buyouts

A leveraged buyout is a transaction in which a company, or a division of a company, is acquired by a specialized investment firm using substantial amount of debt and a relatively low proportion of equity (Kaplan and Strömberg, 2008; Berg and Gottschalg, 2004). Generally, these specialized investment firms are referred to as private equity firms (Ibid.). Private equity firms typically invest in majority positions in existing or mature firms, and are different from venture capital firms, which typically invest in minority positions in early stage companies (Ibid.). The former is the focus of this paper and also includes other arrangements such as management buyouts, where

management together with the private equity investor takes an equity position in the company (e.g. Verma, 1993). Management buyouts can also be independent in the sense that management and other investors invest the necessary portion of equity and raise the necessary debt without involving a private equity firm. Most previous studies have shown, however, that private equity sponsored buyouts constitute the vast majority of buyouts (e.g. Strömberg, 2008; Chung, 2009). Private equity sponsored buyouts are the focus of this paper.

2.1 Development of the LBO market

The LBO market started evolving in the 1970s and grew from under 100 transactions yearly in the late 1970s and early 1980s, to reach around 1400 transactions in 1999 (Strömberg, 2008). Global transaction volume grew from around 100 billion in 1985 USD to around 850 billion USD in 2006. Following the financial crisis, buyout activity has declined heavily. Academic research on global deal activity in the post-crisis years is relatively scarce but according to a report by consultancy Bain & Co (2013), global deal value in 2012 was 186 billion dollars, which is significantly lower than before the crisis.

2.2 Mechanics of the LBO market

The objective of the private equity fund is to provide a return to the fund's investors through selling the company at a higher value than the purchase price (Berg and Gottschalg, 2004). In this sense, private equity buyouts are examples so called of unrelated acquisitions where the motivation is not primarily synergies resulting from integrating the purchased firm into another, but rather from increasing the value of the target itself before selling it (Baker and Montgomery, 2009). The average LBO transaction has a holding period of approximately 25 months and has declined continuously from around 95 in the 70s and 86 in the late 1980s (Strömberg, 2008). At the same time, there is evidence that the returns generated by private equity investors is increasingly a result of improved operational performance rather than the high debt levels (CEFS, 2014). This clearly means that private equity firms, to be able to generate a return for their investors, have to improve the operating performance or operating outlook of their portfolio companies substantially within a relatively short time period. This is especially true after the financial crisis since debt levels in private equity

transactions have generally gone down (Ibid.).This operational development of private equity backed firms is the core issue of investigation in this paper.

2.3 LBO exit process

As mentioned, the objective of the private equity firm is normally to sell the target company at a higher price within a relatively short period of time. The primary buyers of private equity companies are companies within the same or related industries. These are known as strategic buyers. In 2006-2007, 44% of all private equity exits were to strategic buyers (Ibid.). Another option is to sell the company through an initial public offering (IPO) to shareholders in the open market. This used to be a very common way of exiting in the early years of LBO activity. However, the average company going through an LBO now is smaller than during the 1980s, which is probably the reason why the proportion of firms being exited through an IPO has declined steadily since the past two decades (Ibid.). At the same time, the proportion sold to a financial buyer (another private equity firm) has increased steadily over the period to 38% in 2006-2007 from only 6% in the period 1970-1984.

2.4 Private equity in Sweden

Sweden is the largest market for private equity investments among the Nordic countries, and private equity funds play a huge role in the Swedish economy (Groh et al., 2010). For instance, around 200,000 people in Sweden are employed in Swedish private equity owned companies with a total revenue of around SEK 250bn (SVCA, 2013). Private equity companies also play a huge role in attracting capital to Sweden since about 90% of the total SEK 470bn currently under management by Swedish private equity funds are raised from foreign institutions (Ibid.). More interestingly, portfolio companies in Sweden seem to perform well, with returns to private equity funds significantly exceeding those of comparable stock indices, also when leveraging the stock indices by the average target company leverage (SVCA, 2011). This indicates that private equity owners generate excess returns to their investors through improving operating performance of their target companies (Ibid.). The mechanisms through which this may be done will be the focus of this paper.

3 Theory and previous research

This section provides a general overview of previous research on private equity in general and value creation in private equity in particular. Focus will be on theories regarding how private equity ownership may create value, and how value creation in private equity differs across different types of targets and owners.

3.1 Return generation and value creation in buyouts

Returns to owners of private equity firms may be driven either by operational factors or by financial factors. Operational factors include things such as improved margins, growth, and improved efficiency in operations. Financial factors include such things as leverage and increasing earnings multiples over the holding period. Higher leverage in a transaction, for example, may increase the returns to owners, although it does so without creating operational value as such, since higher leverage also increases the risk carried by the owners and any incremental value to investors in excess of that caused by increased risk exposure is due to tax shield effects.

The general view is that leverage was a more important driver of returns in earlier LBO activity when debt levels were higher and operational focus lower, and that the largest part of private equity returns today is driven by operational improvements (e.g. Matthews, Bye, and Howland, 2009; CEFS, 2014). The focus of this paper is on how private equity companies have operational impact through, for example, reducing agency costs, bringing in strategic expertise, and decreasing information asymmetries with creditors.

3.1.1 Operational value creation in buyouts

Various sources of operating impact and value creation resulting from buyouts have been proposed in previous literature. The nature of these have to some extent changed along with the nature of the buyouts that have been studied, although this paper will argue that previous literature may not be sufficient in explaining value creation in private equity today.

This section will provide an overview of previous research on the operating impact of buyouts in the context of this paper, upon which the hypotheses that will be tested in the

main section of the paper will be formed. First, a short introduction to agency theory will be provided and reduction of agency costs as a source of value creation in buyouts will be discussed thoroughly. Secondly, mentoring and parenting advantages in buyouts will be discussed. Then, leveraged buyouts as a mechanism to alleviate credit constraints faced by the target company will be discussed, as well as various other theories relating to the ability of private equity owners to create value for the target companies.

3.1.2 Agency theory and agency costs in buyouts

The agency problem arises from the separation of ownership and control, i.e. the separation of the providers of capital to the firm and the firm's management (Schleifer and Vishny, 1997). The reason why such separation occurs is that the providers of finance need managers' human capital to manage their funds while the managers, or entrepreneurs, need external capital to finance their business. This is either because entrepreneurs do not have enough capital to invest on their own, or simply because they wish to diversify their holdings (Ibid.).

The core question of the agency problem is how providers of capital can then be sure that they will earn a fair return on their capital and that the manager will not engage in sub-optimal transactions that are beneficial to the manager but detrimental to the financiers (Ibid.). Therefore, the agency problem can be said to result from managerial discretion, which in turn results from the fact that complete contracting is infeasible (Ibid.). If all possible future contingencies could easily be covered through a contractual agreement between the providers of capital and the managers, no agency costs would arise (Ibid.). Since this is not possible, residual control rights will have to be allocated to cover any possible contingencies that are not contracted. Such residual control rights will normally be allocated to the manager since the reason why a manger was hired in the first place was to manage – a diversified shareholder is normally not qualified or informed to take the day-to-day decisions resulting from having residual control rights (Ibid.). In addition, allocating residual control rights to shareholders would obviously be very inefficient if the number of shareholders is high.

Since the contracting process normally results in substantial residual control rights being allocated to the manager, managerial discretion and the incentives provided to

managers is of very high importance to the return subsequently earned by the investors. Separation of ownership and control and substantial managerial discretion may result in various problems such as empire building, overpayment of employees and diversion of corporate assets for personal use (Ibid.). It may also simply cause the firm to be run inefficiently if managers are not incentivized to run the firm efficiently. This is the core of the agency problem and the presence of large agency costs in a corporation will obviously decrease the price investors are willing to pay for the firms stock compared to what the price would be in the absence of such costs. Therefore, if private equity ownership can mitigate such agency costs it may result in higher firm value and superior operational performance which in turn may allow private equity funds to generate abnormal returns for their investors. The mechanisms through which this may occur will be discussed in depth below.

3.1.2.1 The incentive-intensity hypothesis and agency cost reduction in buyouts

The reduction of agency costs is the most prominent and most often cited source of operational improvements and value creation in private equity (Berg & Gottschalg, 2004, Wright et al., 2001). Reduction of agency costs may have an effect on operating performance through several channels, primarily resulting from better incentivization of management.

The severity of agency problems within an organization depends on several factors, most notably managerial discretion in decision making, degree of incentive alignment between owners and managers and the degree to which managerial actions which are not shareholder-value-maximizing can be observed and sanctioned (Jensen & Meckling, 1976). LBO structures have been claimed to improve the above determinants of agency costs compared to dispersed public ownership, and the problems of managerial incentive alignment that persist in companies with dispersed ownership have been argued to be smaller in LBO structured companies. This is the essence of the incentive-intensity hypothesis (Liebeskind et al., 1992)

LBOs can reduce agency costs through affecting all of the three determinants of agency costs above. One source of high managerial discretion and thus high agency costs is significant free cash flows, defined as cash flows in excess of what is required to finance

all available NPV-positive projects (Jensen, 1986). In companies where ownership and control are separated and where free cash flow is substantial, the question arises of how to motivate managers to pay any excess cash out to shareholders, since managers have an incentive to grow the firm beyond its optimal size (Ibid.). Issuing debt in exchange for stock is one way of effectively committing to pay out future cash flows. In that sense, as a mechanism for reducing managerial discretion, debt can be an effective substitute for dividends (Ibid.). Increases in leverage, and thereby interest and amortization costs, also provides incentives to management to improve operating performance to make sure that bankruptcy is avoided (Ibid.). An additional effect of debt is the positive impact of outsourced governance, since lenders are clearly incentivized to monitor management to make sure that they will be paid back (Berg & Gottschalg, 2004). Debt covenants, for example, can act to provide additional constraints on investments and thus limit managerial discretion. This mechanism of agency costs reduction is highly relevant in the study of LBOs, since one of the distinctive characteristics of LBOs is the high use of debt (Jensen, 1989a). It has been argued that the rationale of LBOs altogether, at least the LBO activity in the US in the 1980s, stem from the very high agency costs resulting from the separation of ownership and control (Ibid.). It has also been argued that the use of debt as a mechanism of agency costs reduction will be most effective in organizations with low or negative growth in mature markets, since these are the companies where free cash flows are likely to be higher (Ibid.).

Based on the above hypothesis regarding value creation in LBOs, one would expect LBOs to be concentrated within mature industries and on public companies with low growth and high free cash flows, since this is where the value creation potential would be largest. In addition, one would expect that the value created would be larger for such targets. If managerial discretion prior to the LBO has been too high and managers, as discussed above, have an incentive to grow the firm above its optimal size, one would also expect an LBO to be followed by downsizing initiatives. To the extent that the higher levels of debt successfully results in better incentive alignment between managers and owners, one would also expect an abnormal positive development in the profitability of LBO targets following the transaction. These inferences are confirmed by several studies. Lehn and Poulsen (1989) show, based on a sample of 263 public-to-private

LBOs between 1980 and 1987, that high free cash flows increases the probability for a firm to be taken private, and that the premiums paid to shareholders in such a transaction is positively correlated with the undistributed cash flow. Opler and Titman (1993) show that firms which are subject to LBOs are generally firms with both a lack of favorable investment opportunities and relatively high free cash flows, which supports the theory that LBOs create value through forcing distribution of excess cash, that may otherwise have been invested at a return below the cost of capital, to shareholders. Furthermore, Kaplan (1989) shows that the profits increase in LBO targets primarily is a result of a reduced asset base and a decrease in investments, which is consistent with the hypothesis that LBOs create value through targeting firms where, prior to the LBO, managerial empire building is more likely to occur. Similar conclusions have been reached in several studies after that, for example in Lichtenberg and Siegel (1990), Chevalier (1995), Harris et al. (2007) Davis et al. (2008) etc. and summarized by Cumming, Siegel and Wright (2007).

As discussed shortly above, there is also evidence that agency costs are reduced following LBOs also through other channels than reducing managerial discretion, for example through increased alignment of incentives. For example, Muscarella and Vetsuypens (1990) study 72 reverse LBOs[1] between 1983 and 1990, and show that prior to the public offering, managerial ownership among the LBO-targets was much higher than among comparable firms that had not been targeted. They also show that insider ownership nearly doubled during the holding period, compared to the pre-LBO level, and that a high proportion of LBO-targets tend to use performance based compensation plans for management (Ibid.). The increased use of performance based compensation following an LBO is also discussed and justified on a theoretical basis by Fox and Marcus (1992).

Since inside ownership and performance based compensation are measures that make any decisions that do not maximize shareholder value more costly for management (to the extent that the performance measure used for compensation is sufficiently

[1] The term reverse LBO refers to the public listing of a firm which has previously been listed but taken private through an LBO transaction

correlated with the payoff to equity holders), they serve to decrease any misalignment in incentives between owners and managers. Therefore, the implementation of these measures is consistent with decreasing agency costs being an important source of value creation in LBOs. It is obviously also the case that equity participation increases the potential gain for managers resulting from any value-maximization actions (Jensen & Meckling, 1976).

Finally, the highly concentrated equity stakes resulting from an LBO transaction creates large incentives for increased monitoring, and LBO investors indeed tend, for example, to be highly active on the board of directors (Jensen, 1989b).

As discussed above, the reduction of agency costs is by far the most common explanation for value creation in LBOs. The research supporting this hypothesis, some of which was presented above, is almost solely based on US public firms being taken private in the 80s and 90s. The main reason why most studies have been done in the US is because the US has the largest LBO market by far (Strömberg, 2008). The reason why the research has been done mainly on public-to-private transactions is the lack of data on private firms in the US (Bergström et. al., 2007). Unfortunately, there are at least two (highly interrelated) potential issues from drawing conclusions from these studies regarding value creation in contemporary LBOs. First of all, countries differ widely in terms of their corporate governance systems (e.g. Djankov et al., 2008), and in terms of market outcomes. This means that dispersed ownership is far from the norm in most countries other than common law countries. As a consequence, public-to-private LBO transactions constitute only a very small fraction of the total number of transactions. The major part of the LBOs in most countries is private-to-private LBOs (Strömberg, 2008). In fact, although public-to-private deals constituted 29% of total global deal value between 2001 and 2007, the number of public-to-private deals only constituted 7% of the total global number of buyouts during the same period, while approximately 40% were private-to-private transactions. Therefore, a reduction of agency costs caused by dispersed ownership, although relevant for public-to-private transactions, can definitely not be the main driver behind value creation in buyouts globally.

3.1.3 Mentoring and the parenting advantage

Some perspectives on value creation in LBOs focusing not only on downsizing as a mechanism for operational improvements have also been offered. Mentoring effects are an example of such ideas. Mentoring effects and the parenting advantage are closely related terms used to describe a broad range of positive consequences resulting from private equity ownership. Primarily, they relate to positive effects for portfolio companies resulting from being part of a buyout firm's portfolio as a consequence of the resources that the private equity sponsor has, similar to effects that have been described in prior research for business units within conglomerates (e.g. Berg & Gottschalg, 2004; Bergström et. al., 2007). For example, several studies have reported higher motivation among employees following a buy-out (e.g. Beaver, 2001). Admittedly, such effects may partly result simply from higher insider ownership, but several studies claim that they result also from an increase in the entrepreneurial spirit within the organization (Ibid.). For example, in a divisional buy-out where a division with opportunities to grow and improve its competitive position have previously been marginalized, an LBO may provide the resources needed for such expansion and put the previously marginalized division at the center of attention, which may increase entrepreneurial spirit within the organization and allow the company to grow (e.g. Wright et. al., 2001; Butler, 2001).

There may be other benefits resulting from being a part of the private equity company's portfolio. There are several examples of positive synergies resulting from informal contacts between executives in different portfolio companies that have been facilitated by the fund (Kester & Luehrman, 1995). In addition, private equity owners tend to use their board positions to be highly active in terms of management selection, providing support to management and also replacing management in case performance is not satisfactory (Anders, 1992). There are several reasons why it may be easier for private equity owners to be active in replacing management in case of bad performance, including less emotional attachment than in case of, for example, family ownership (Ibid.). In addition, the very high level of debt typically applied in private equity backed LBO or MBO transactions helps create a sense of urgency with respect to management performance, because of the threat of bankruptcy (Ibid.). Private equity owners will

typically also be able to utilize their network to find qualified and competent candidates for top level management positions (Bruining and Wright, 2002).

Another benefit comes from what can be described as economies of scope of managerial knowledge and talent. Buyout-specialists can bring management expertise gained from previous transactions to the target, and often involve management from previous buyouts as advisors to new targets (Hite and Vetsuypens, 1989). This enhanced managerial knowledge is a direct consequence of private equity ownership and may have positive operational consequences (Ibid.). For example, private equity owners may assist management in strategic decision making, leadership and evaluating potential acquisitions (Bruining and Wright, 2002).

Various studies show proof of improved strategic and operational performance in the period following a buyout, which could be categorized as mentoring and parenting advantages. For example, buyout firms tend to be more efficient in their working capital management than non-buyout firms (Holthausen and Larcker, 1996) and have much lower levels of inventory and receivables than in the pre-buyout period (Easterwood et al., 1989).

3.1.4 Alleviation of credit constraints in LBO transactions

Boucly et al. (2011) has presented the idea that private equity ownership in private-to-private transactions create value through alleviating credit constraints which facilitates expansion and allows the target to exploit profitable growth opportunities. This hypothesis is supported by showing that when looking at only private-to-private rather than public-to-private transactions, the post-buyout period is characterized by abnormal growth in assets, turnover and number of employees (Ibid.). This is inconsistent with previous evidence showing increasing profitability largely as a result of downsizing and more efficient operations. Boucly et al. (Ibid.) also show that such growth in assets and employees is concentrated among private-to-private transactions, and that public-to-private transactions indeed tend to downsize in the post-buyout period. They further show that post-buyout growth is even stronger in industries where reliance on external financing is traditionally stronger than in industries with lower such dependence, lending further support to the hypothesis that one of the channels of

value creation is indeed alleviation of credit constraints (Ibid.). It is also shown that target leverage tends to increase after a buyout, which also supports the hypothesis (Ibid.).

Theoretically, the explanation that a buyout can increase a targets' debt capacity is appealing for several reasons, most of which are outlined in the discussion of agency costs and mentoring effects above. Since private equity owners have a strong incentive to monitor managers and are expected to be activist investors with a high level of financial and strategic expertise and a strong network of connections, it is likely that a private equity backed company may be perceived as a more credible borrower (Ibid.).

3.1.5 Value creation and value-redistribution

Some scholars have claimed that although buyouts create value for investors, this is primarily done through capturing rents caused by economic distortion without creating any value from a social perspective (e.g. Drucker, 1986). Although these views were most prominent in the early buyout-waves, some of the concerns are still widely discussed today. For example, Schleifer and Summers (1988) show theoretically that buyouts can be beneficial for investors even when they are not desirable from a social perspective through facilitating opportunistic behavior and the renegotiation of implicit and explicit contracts at the expense of stakeholders. This may be the case, for example, when managers due to agency problems are more loyal to employees than to shareholders, and overpay employees. If private equity owners can capture value through reducing wages in such companies, that would be a case of value redistribution rather than value creation. To the extent that this is the case, using the shareholder gains as a measure of welfare gains resulting from buyouts will be misleading since redistributive effects are not accounted for in such calculations (Ibid.). Schleifer and Summers (Ibid.) also argue that rent extraction from employees is likely to be a much easier and more beneficial mechanism of generating return for private equity investors than through reducing other types agency costs. On a more general level, it is also suggested that reputational externalities stemming from corporate takeovers may have severe allocative consequences (Ibid.).

Evidence has been provided to support hypotheses like the above. For example, Amess and Wright (2007) have shown that LBO targets show similar development in employment in the post-buyout period, but have significantly lower growth in wages than the control group. This is consistent with the hypothesis that some of the gains from LBO may be redistributed wealth stemming from the breach of implicit contracts, rather than value created as a result of the buyout.

3.1.6 Evidence on effect of different types of buyouts

Surprisingly few studies differentiate their results in terms of different types of buyouts. Studies tend to either study only a very specific type of buyout (e.g. public-to-private), or use a pooled set of buyouts without any differentiation. Studies on public-to-private transactions are numerous and present a relatively homogenous picture: increasing profitability and lower investments in the post-buyout period, as described above. In addition, quite a few studies either study a pooled dataset of buyouts without differentiating, or do not mention which types of buyouts are studied (e.g. Amess and Wright, 2007). Among these studies, evidence is mixed, and may show positive, insignificant or negative impact on both profitability and investment, as discussed in detail above. However, since different buyouts may be very different, simply studying pooled datasets without differentiating between them may lead to faulty conclusions.

3.1.6.1 Secondary and Primary buyouts

Buyouts are sometimes differentiated into primary and secondary buyouts, secondary buyouts being where a company that has already been subject to a buyout is subject to a new buyout. Secondary buyouts have not received a lot of attention in research even if they have grown substantially in frequency recently (Degeorge et al., 2013). Given this growing importance of secondary buyouts as a means of conducting (and exiting) a buyout, the impact of such transactions warrants further investigation. Today, secondary buyouts comprise 26% of all LBO activity compared to around 2% in the 1980s (Kaplan and Strömberg, 2009).

It has been argued that secondary buyouts should have only a limited positive operational impact since solutions to agency problems may generate a one-time large improvement in operational performance (Amess et al., 2009). However, such an

argument will of course only have a bearing in case the reduction of agency costs is the only source of positive operational impact, which seems very unlikely on the basis of the discussion above. Bergström et al. (2007) present a similar hypothesis, stating that most potential efficiency measures have probably been implemented by the time a buyout is exited, so that there should be limited opportunities for a second private equity owner to further improve operational performance. Such a hypothesis is questionable for several reasons, however. First of all, again, it is not clear that increased efficiency and/or increased profitability were the objective in the first buyout. In fact, the objective may have been revenue growth, achieved for example through alleviation of credit constraints previously faced by the company, as discussed above. Secondly, the fact that secondary buyouts have grown from constituting 2% to 26% of all LBOs is not easily reconcilable with the hypothesis that such transactions do not create value.

Secondary buyouts have, in fact, been shown to be inferior to primary buyouts in terms of the returns they generate to buyout firms (Degeorge et al., 2013) although there are also other studies that find no such difference (Achleitner and Figge, 2012). Secondary buyouts have also been shown to be priced at a premium of 15% compared to primary buyouts (Wang, 2010), which may help explain the lower return to investors. However, according to Achleitner and Figge (2012), there is no indication that the potential for operational improvements is lower in secondary buyouts.

Since secondary LBOs both seem to be more expensive and, at least to some extent, to generate lower returns to the investors, the hypothesis that most of the value is captured by the first owner is not completely implausible. The conclusion that is most easily reconciled with the idea of an efficient market for corporate control is that secondary buyouts may be more expensively priced and (consequently) generate lower returns because private equity owners add credibility to a company and that such companies are therefore perceived as less risky by buyers. The risk dimension is obviously a very important determinant in the returns required by an investor and consequently the price that an investor is willing to pay. Yet, this dimension is very often neglected when comparing the returns of different types of transactions.

Conclusively, the empirical evidence on secondary buyouts is both scarce and mixed and more empirical investigation is therefore important to help understand the effect of such transactions.

3.1.6.2 Cross-border buyouts

Cross-border buyouts, defined as a buy-out where the target and the private equity firm are located in different countries, however interesting, have not been thoroughly studied either. Scellato and Ughetto (2012) hypothesize that the cost and efficiency of monitoring and providing strategic advice is sensitive to the distance between investors and investees. Since private equity investors have been shown to spend significant time at the target company because this is required for efficient monitoring, geographical proximity between target and investor may indeed facilitate value creation in buyouts (Sorenson and Stuart, 2001). To the extent that this is the case, companies backed by private equity funds in the same country may be expected to outperform those backed by private equity funds in another country (Ibid.). Indeed, when examining 241 European private-to-private buyouts, Scellato and Ughetto (Ibid.) show that those backed by private equity funds from the same country perform better in the post-buyout period in terms of profitability.

Again, research on the topic is scarce. The hypothesis above, although logically sound, is not appealing in isolation, since there would be little motivation to undertake cross-border LBOs if they consistently underperform. It could of course be argued that international investors receive diversification benefits from cross-border buyouts that make such transactions attractive, or that there are scale economies in buyout activity that spur international transactions. Given the lack of clarity in terms of evidence on this topic, it is the intention of this study to further examine the nature of such investments and their operational impact in the post-buyout period.

3.1.6.3 Buyer characteristics and operational development

Some studies have also studied the connection between various characteristics of the buyer and subsequent outcomes in terms of, for example, operational performance of the target or realized returns. Scellato and Ughetto (Ibid.) put forward the hypothesis

that those private equity funds which are specialized on, for example, specific part of a company's lifecycle or other specific situations are likely to have a more positive impact on target operational performance than generalist buyout funds. Potential benefits may arise from decreased information asymmetries as the private equity fund gain increasing knowledge about, for example, a particular industry (Cressy et al., 2007). The other side of specialization is of course a more homogenous risk exposure and a less diversified portfolio (Ibid.).

These hypotheses were confirmed by both studies discussed above. Cressy et al. (2007) showed that targets of industry-specialized private equity funds outperform those of generalist funds. No profitability effect was found for stage-specialized funds although there was some evidence that targets of stage-specialized funds tend to grow faster than other firms (Ibid.).

3.1.7 Recent empirical evidence and reconciliation with theory

Although the fact that operating performance in terms of profitability tends to increase in the post-buyout period has been generally accepted and supported, recent research has cast doubt on this. For example, Weir et al. (2008) show, studying a sample of 122 buyouts between 1998 and 2004, that post-buyout profitability in terms of return on equity and return on capital falls in the post-buyout period. The same is true for target employment and EBITDA. Guo et al. (2011) also find ambiguous operating performance following buyouts for a sample of UK buyouts between 1990 and 2006. Similarly, Jelic and Wright (2011), studying a very large sample of buyouts in the UK between 1980 and 2009, also show that buyouts backed by private equity funds show lower post-buyout profitability in terms of return on assets. However, Jelic and Wright (Ibid.) for example do not differentiate buyouts according to previous ownership. Scellato and Ughetto (2012) show that private buyout-targets tend to be characterized by abnormally high growth in the post-buyout period, but by a negative relative development in profitability with respect to their peer-group. Such a result is very consistent with the credit-constraint hypothesis presented by Boucly et al. (2011).

The recent lack of evidence on profitability has sometimes led researchers to conclude the large gains earned by private equity funds in the earlier waves of buyouts have

vanished due to, for example, higher degree of competition among buyout specialists (Ibid.). However, since gains resulting from financial leverage have most definitely become less important (e.g. CEFS, 2014), a thorough analysis of where gains in modern LBO transactions actually come from is necessary. Part of this problem may stem from the level of analysis. This paper attempts to clarify some of these discrepancies by studying buyouts on a more detailed level than what has most often done previously. Furthermore, it is the aim of this paper to move from the somewhat arbitrary hypothesis-formulation with respect to operational value creation for different categories of buyouts which has been seen in some previous research, to a more theoretically grounded view of how different types of buyouts may create value in different ways.

3.1.7.1 Empirical evidence on the impact of buyouts in Sweden

Bergström et al. (2007) investigate the operating performance of 73 Swedish private-equity sponsored buyouts exited between 1998 and 2006 in a matched-sample study, and show that profitability tends to increase in the holding period. For example, the EBITDA-margin of a buyout target tends to increase by approximately 3% relative to the peer group while the mean increase in return on invested capital (ROIC) over the holding period is 17% (Ibid.). No significant difference in revenue growth is found between the buyout targets and the control group. In addition, no evidence of decreasing levels of employment or decreasing wage levels following the buyout is found in the study, although it is shown that for those buyouts where wages do, on average, decrease, profitability tends to be larger. Furthermore, the study finds no difference in buyout performance between different types of buyouts (Ibid.).

Except for the non-significant changes in wages and employment, Bergstrom et al. (Ibid.) obtain results that are in line with previous evidence, in particular with respect to profitability. This study does, however, have some methodological problems worth addressing which will be discussed in depth below.

4 Hypothesis development

As discussed extensively above, evidence with respect to profitability has been relatively homogenous, with increasing profitability in the post-out period being the most common result in previous empirical studies. Such an effect is also theoretically supported both by parenting effects and the potential for reducing agency costs. Therefore, the first hypothesis put forward in this paper is:

Hypothesis 1: Buyout targets experience an increase in profitability in the years following the buyout relative to relevant peers.

However, there may be reasons to believe that increasing profitability is not of equal importance to all target firms. Different types of targets may be targeted for different reasons, as discussed above. For example, as Boucly et al. (2011) shows, an additional target for portfolio companies may be growth. Since growth requires investment and corporate resources, it is often initially negatively correlated with profitability, which means that these two objectives may not be compatible in the short run. This is a well known trade-off in corporate strategy discussed by e.g. Marris (1967). Revenue growth and margin growth are clearly both sources of increasing returns to the equity holders. Therefore, to some extent, one can be seen as a substitute for the other depending on the situation of the specific portfolio company. An hypothesis of when one will be prioritized over the other would therefore be helpful in testing how and whether buyouts add value. By combining results from Boucly et al. (Ibid.) with those of earlier research presented above, one potential hypothesis can be put forward. Companies that are more likely to have been facing credit-constrains and thus been constrained in their growth prior to the buyout, are more likely to focus more on growth in the post-buyout period. In other words, this is the most likely source of returns for the company backing the buyout. Using the same line of argument, the focus for companies that have not been credit constrained and thus not constrained in their growth prior to the buyout period may be more on profitability than on growth. One such category is public-to-private transactions, since public firms tend to be less credit constrained than private firms, which is one of the reasons for going public in the first place (Ibid.) Secondly, divisional buyouts are also less likely to be credit constrained, since they are usually part of a

larger corporate network and can compete for internal financing (Ibid.). Finally, secondary buyouts should definitely be less likely to be credit constrained if private equity funds have a mitigating effect on credit constraints, since such firms are already under private equity ownership.

It should be noted that hypothesis 1 still predicts increasing profitability for all buyouts on average. For public buyouts, this is a very natural hypothesis since there are both theoretical grounds (reduced agency costs and mentoring and parenting advantages) to expect increasing profitability. For private buyouts, on the other hand, if relaxed credit constraints lead to higher growth, profitability may decline initially for reasons discussed above. At the same time, mentoring and parenting advantages should, all else equal, lead to increased profitability. Since there is no reason to (ex-ante) expect any specific effect to dominate, an increase in profitability is expected for the sample as a whole, but the increase in profitability is expected to be concentrated in buyouts that were not credit constrained prior to the buyout.

Based on the above, sample targets can be categorized into two different groups depending on their likelihood of having been constrained in their growth in the pre-deal period due to credit constraints. Private buyouts have a relatively high probability of having been credit constrained prior to the buyout, while divisional, secondary and public buyouts have a relatively low probability of having been credit constrained prior to the buyout. This categorization of buyouts will be maintained throughout most of the paper. The two categories will interchangeably be referred to as private (public, divisional and secondary) buyouts and buyouts with a high (low) probability of having faced credit constrains in the pre-buyout period.

The discussion regarding the probability of being credit constrained in the pre-buyout period for various buyouts, in combination with the short-term incompatibility of growing in terms of both size and profitability, leads to the formulation of the following hypotheses:

Hypothesis 2: Increases in profitability will be concentrated within firms with low probability of having faced credit constraints in the pre-buyout period.

Hypothesis 3: Firms with high probability of having faced credit constraints in the pre-buyout period will experience higher growth in the post-buyout period relative to their peers.

It should be noted that hypothesis 2 is essentially the incentive-intensity hypothesis discussed above, since most private-to-private deals are owner-managed in the pre-buyout period (Ibid.), where the agency problems on which the incentive-intensity hypothesis is based do not exist by definition.

It should also be noted that an equivalent way of stating hypothesis 3 is that post-buyout outperformance in terms of growth is concentrated in companies with a relatively high probability of having been credit constrained prior to the buyout. The reason for this is that there is a clear theoretical basis for stating such a hypothesis for firms with a relatively high probability of being credit constrained prior to the buyout, namely that private equity funds may alleviate such credit constraints to allow growth that was previously impossible. For the other category of buyouts, it is hard to formulate a clear hypothesis since mentoring and parenting effects may contribute to higher growth compared to peers, while a reduction in agency costs following a buyout would normally be associated with a decrease in investment. From previous empirical evidence presented above, the latter effect seems to dominate the former.

As discussed above, monitoring and the implementation of strategic initiatives are expected to be more costly with increasing geographic distance, which leads to the following hypothesis:

Hypothesis 4: Cross-border buyouts will experience inferior development in profitability in the post-buyout period compared to domestic buyouts

To the extent that private equity firms help credit constrained target firms grow through alleviating such credit constraints based on their experience and network, there is no reason to expect a negative cross-border effect on growth.

Finally, as discussed above, it has been argued that most gains resulting from buyout transactions are actually value redistribution rather than value creation. One commonly cited source of value redistribution is wage reduction, or abnormally slow growth in

wages. Since public companies may have an incentive to overpay their employees, it should be expected that abnormally slow wage growth is most likely to occur in public buyouts. In addition, talented employees and the ability to attract human capital may be highly valued in a fast-growing company, while more mature firms may be more likely to focus on cost control. Therefore, an incentive may exist to reduce wages (or grow them slower compared to peers) in companies where agency costs have previously been high, but not in companies where this has not been the case. In general, as discussed above, firms not likely to have been credit constrained in the pre-buyout period are expected to focus more on profitability than on growth in the post-buyout period since this is where private equity funds can add value for such firms. Therefore, wage reductions are expected to be concentrated in such targets.

This leads to the following hypothesis:

Hypothesis 5: Firms with low probability of having faced credit constraints prior to the buyout will experience a decrease in wages in the post-buyout period relative to peers.

Exactly the same line of argument holds true with respect to efficiency, since the strategic measures implemented when positioning a company for growth are very different from those implemented in the pursuit of cost cutting. For example, in anticipation of future sales growth, a company may build up inventories, which leads to an increase in working capital. In anticipation of lower future sales growth and as a measure to increase profitability, a private equity sponsor may assist in the implementation of strategic measures to decrease working capital levels, for example through lean process optimization or similar initiatives. This is theoretically in line with the parenting- and mentoring effects and leads to the following hypothesis:

Hypothesis 6: Firms with low probability of having faced credit constraints prior to the buyout will experience an increase in efficiency measures following the buyout.

Specific variables to measure efficiency on the firm level will be defined in section 5 together with all other relevant variables.

5 Methodology

5.1 Sample selection

This study will cover buyouts that occurred in Sweden between and including 2006 through 2009. Sweden was chosen as the market to study for several reasons. First of all, research on buyouts and their effects in the Swedish market is scarce even though Sweden is the largest market for such transactions among the Nordic countries and has been categorized as the fourth most attractive country for such investments in Europe (Groh et al., 2010).

The studies that do exist, e.g. Bergström et al. (2007), are on non-overlapping sample periods, with a focus that differs from that of this study and most importantly, using a very different methodology. To truly understand the operating impact of private equity ownership, new studies applying new methodologies must be conducted on new samples in more recent periods. Although the study by Bergström et al. (Ibid.) presents some interesting results, there are some serious methodological issues. For example, private equity targets going bankrupt during the ownership period are excluded from the study by Bergström et al. (Ibid.), which means that there is a clear potential survivorship bias in the sample. To the extent that bankruptcies are preceded by abnormally poor operating performance in terms of sales growth and profitability, such a bias may lead to an overstatement of the operational performance of buyouts. In addition, the control group used by Bergström et al. (Ibid.) is created by using the 20 largest companies in each relevant industry and is thus matched with the sample only on industry and on no other operating variables. This again creates a potential bias since the largest companies in any particular industry are likely to differ in terms of their operational development compared to buyout targets, which may or may not be included in this category. In addition, the control groups were constructed using the 20 largest firms at the time of the sample construction (2005) and not at the point in time where the actual buyout occurred (1993-2005). This clearly introduces a potential survivorship bias also in the control group, since firms that experienced lower sales growth in the sample period (1993-2005) are obviously less likely to be among the largest 20 firms in 2005. Finally, the study focuses only on buyouts in Sweden conducted

by the 300 largest global private equity funds which may be one of the reasons for the relatively small sample in the study despite the fairly long sample period (Ibid.).

The sample period for this study was chosen on the basis of data availability since most databases provide financial data for private companies only for the past 10 years. Financial data for 3 pre-buyout years and 3 post-buyout years will be used in the analysis. Therefore, the 4 years in the middle of the most recent 10-year period with available financial accounts were chosen.

5.2 Data extraction and sample construction

For identifying deals in the relevant period, Mergermarket, an intelligence database containing various information and statistics relating to mergers and acquisitions in general, was chosen. All deals classified as buyouts by the Mergermarket database where the target was located in Sweden and occurring within the relevant years were retrieved from the database, along with the name of the buyer, the name of the target company, the name of the selling entity (if any) and the deal description provided by Mergermarket. This search resulted in 211 deals.

Financial data was gathered from the Orbis database provided by the Bureau van Dijk. Since there is no unique ID allowing companies between the two databases to be easily linked, targets had to be matched manually using names in the Orbis database. Where any doubts existed, companies' websites, addresses, trade descriptions and financials at the time of the buyout were compared across the two databases.

In addition, it is common practice that a new holding company is established at the time of the buyout and that consolidated accounts are provided through that holding company from the buyout and onwards (e.g. Scellato and Ughetto, 2012). Since buyouts may also be followed by changes and simplifications to the company structure, which may impact financial accounts on a non-consolidated basis, but should not do so on a consolidated basis, the operational impact of buyouts should be studied using consolidated accounts (Ibid.). However, this means that financial variables for each target have to be retrieved for two different companies for the pre- and the post-buyout period, respectively. This requires the new holding company to be manually matched with the old which was again done through matching the two companies on several

variables like name, website, financial variables, addresses, owner, and trade description.

Deals for which the target company could not be found in the Orbis database, or for which doubts persisted despite the checks conducted above, or for which the target company did not have financial data for 3 years before the buyout and 3 years after, were excluded from the sample. This reduced the number of buyouts in the sample to 113.

For the remaining 113 targets, all financial variables available through the Orbis database were extracted for each company.

5.3 Operating variables

As discussed above, the objective of this paper is to study the operating impact of buyouts on target companies. The focus will be on three main categories of indicators of operational development, namely measures of profitability, measures of size and growth, and measures of efficiency.

Measures of profitability most often involve some income-variable scaled by some indicator of the size of operations. The primary indicators of profitability studied in this paper will be earnings before interest expenses, taxation expenses, depreciation expenses, and amortization expenses (EBITDA) scaled by total net sales and total assets. These two profitability indicators will be termed return on sales (ROS) and return on assets (ROA), respectively. There are several reasons why a profitability measure based on EBITDA is preferable to one based on net income, for example. First of all, EBITDA is capital structure neutral since it excludes interest expenses, meaning that any (likely) changes in leverage following the buyout will not affect this measure of operating performance. Since the objective of this study is to capture the operating impact of buyouts and not the impact resulting from the choice of capital structure, EBITDA is a suitable measure. Furthermore, revaluation of corporate assets at the time of the transaction may cause changes to the depreciation schedule which affects the target company's income-based ROA (Boucly et al., 2011). Using EBITDA in the numerator,

however, makes ROA immune to such changes, although the asset base itself may of course still be inflated by asset write-ups, as discussed at length below.

A potential problem recognized during the sample construction process was that many companies do not report EBITDA. This is especially common for the earlier sample periods. To be certain that any reductions in sample size do not introduce a systematic selection bias, profitability measures constructed using alternative income-variables, most importantly net income, were also be examined. Any such variables should, of course, be interpreted keeping the above considerations in mind.

There are some additional methodological problems relating to these measures which have previously been discussed in the literature. For example, Bergström et al. (2007) mention that add-on acquisitions, which is common practice in the post-buyout period, may inflate asset growth in that period compared to peers. However, although differentiating between organic growth and non-organic growth in the post-buyout period may be helpful, acquiring a company is in principle a substitute to acquiring the equivalent assets in the open market. Therefore the increase in a company's assets resulting from an add-on acquisition cannot be called inflated. Since the target companies are compared to a peer-group of non-target companies, the construction of which will be discussed in detail below, which may also grow through organic or non-organic growth this is not considered an important methodological issue in this paper. If a private equity sponsor contributes to the growth of a company through alleviating credit constraints that the company has previously faced, for example, it is not important for this analysis whether such growth is organic or non-organic.

What may be a bigger issue, however, are asset write-ups at the time of the transaction (Boucly et al., 2012). Asset write-ups and goodwill recognition resulting from the transaction itself is something that have been discussed marginally in previous papers. This risks introducing a serious bias to the sample, since it occurs only for target firms and not for any of the firms in the control group. If targets experience a mechanical increase in assets compared to control firms, ROA in the post-buyout period will be deflated. This is a problem that is very hard to solve, although some potential solutions to reduce the impact of this problem will be explored in the paper. This is also one of the

reasons why ROS is used as an alternative profitability measure, since ROS (when EBITDA is used in the numerator) is unaffected by all balance-sheet changes.

With respect to measuring size and growth, the main focus will be on changes in revenue, changes in assets and changes in number of employees. Studying changes in assets as a proxy for corporate growth are, of course, subject to the same potential problem as above, and various potential solutions and alternative measures will be explored later in the paper. Again, development in sales and employees are used as complementing variables. The optimal variable to use would be investment or capital expenditures, which is essentially what changes in fixed assets would capture, if there would not be any noise resulting from asset write-ups. Having data on capital expenditures, of course, would be a superior alternative but such data is unfortunately only available for listed companies through Orbis.

To measure the operational efficiency of targets and control firms, working capital, sales per employee and asset turnover will be used. Working capital is defined as current assets less current liabilities excluding short term loans. Current assets and current liabilities are used because the financial statements provided by the Orbis database do not allow any further differentiation of these items. Cash and short-term deposits are deducted from current assets because it is part of companies' financing and not operations.

Working capital is scaled by total revenue in all estimations to remove any working capital impact resulting from increasing sales.

To measure the impact of buyouts on wage development, to be able to differentiate between value creation and value redistribution, average per-employee wages are measured through total wage expenditure divided by the total number of employees. This is arguably a relatively crude measure since it requires the assumption that all employees within any firm earns the same wage, or if not, that the composition of the various types of employees within each firm does not change relative to that firm's peers. This may or may not be a realistic assumption on average but it is forced upon the analysis by data restrictions and the same methodology has been applied in previous

many previous studies on the wage effects of buyouts (Amess and Wright, 2007) and on the wage effect of mergers and acquisitions in general (Conyon et al., 2004).

5.4 Construction of control group

The objective of constructing a control group in the analysis of the impact of buyouts on operative performance is to construct a realistic counterfactual, i.e. to be able to compare the buyout targets to similar companies that were not bought by private equity funds. In this study, the control group was defined the same way as in Boucly et al. (2011) which is similar to most previous studies and practically equivalent in principle to the propensity score matching procedure implemented in some studies, e.g. Scellato and Ughetto (2012).

The control group was constructed through exporting from Orbis the relevant financial data for all Swedish firms that were active sometime in the period between 2003 and 2012. Based on this export, firms were classified as control firms when simultaneously fulfilling the following three criteria:

First of all, to be included as a control firm to a certain LBO target it was required that the firm, in the year prior to the transaction, belonged to the same industry (defined using the two-digit NACE code) as that LBO target. The two-digit industry code is a relatively broad industry definition but the definition of all criteria in this matching procedure is simply motivated by the tradeoff of making sure that all firms have a sufficient number of control firms, while also making sure that those control firms are similar enough to be relevant.

The second criteria was that the control firm had a revenue which was in the +/- 50% bracket with respect to the target company.

The third criteria was that the control firm had a ROA, defined as above, which was in the +/- 50% bracket with respect to the target company. Again, the +/- 50% cutoff points were motivated by the trade-off between relevance and number of observations since further narrowing those brackets would obviously lead to a decrease in number of observations. If any target company had more than 5 potential control firms, only the 5 potential control firms with the smallest sum of squared differences between the target

firm's and control firm's revenue, and the target firm's and control firm's ROA, was included as control firms, similar to the procedure for control group construction implemented by Boucly et al. (2011).

The objective of building the control group was to form a group of firms which develops in the same way the target would have developed, had it not been subject to a buyout. This objective was the reason why firms were matched on industry, size and profitability, since studying outcomes in terms of development in size and profitability is the purpose of this study. In addition, several studies have shown profitability to be highly mean-reverting (e.g. Nordal and Naes, 2012), which further strengthens the importance of such matching and makes the lack of such matching a potential weakness in the control group construction of some previous studies, e.g. that of Bergström et al. (2007) on the Swedish market.

5.5 Empirical estimation

In this study, the outcome in terms of post-buyout operational impact is studied using a difference-in-differences (DD) estimation with the operating measures defined above as the dependent variables.

More specifically, several versions of the following regression are performed:

$$Y_{jt} = \alpha_j + \delta_t + post_{jt} + postfirm_{jt} + \varepsilon_{jt} \qquad (1)$$

In equation 1, j is a firm-index and t is a year-index. Y is the various performance variables defined above, $post_{jt}$ is a variable set to equal 0 before the buyout and 1 after the buyout for the target firms and their corresponding control firms, while $postfirm_{jt}$ is a variable set to equal 0 before the buyout and 1 after the buyout for the target firms, and simply 0 for the control firms. Hence, postfirm is the variable that captures the effect of the buyout on the relevant dependent variable. All regression include firm and time fixed effects and standard errors are clustered at the firm level in all regressions.

One potential problem exists when applying this DD procedure to buyouts. When implementing a DD estimation, interventions (in this case, buyouts), should be random conditional only on the fixed effects. This is most likely not the case for buyouts. Most

likely, buyouts are endogenous and determined, for example, based on expectations of future profitability and growth, which can, for several reasons, only to a certain extent be proxied for through historical data. For example, as discussed above, some operational variables tend to be mean-reverting and current profitability may therefore not be a good predictor for expectations of future profitability. In addition, the information content from limited financial data is probably low in relation to the information content from a thorough due diligence procedure. As pointed out by Boucly et al. (2011), in the absence of a good instrument, results obtained using the equation above may be subject to an endogeneity bias and should therefore not be interpreted as causal but as descriptive and indicative.

6 Empirical results

6.1 Descriptive sample characteristics

Table 1 shows a descriptive summary of deals over type and over years. It should be noted that the total percentages add up to 100 only when summing public four first buyout categories (public, private, secondary and divisional), since these are the only categories that are mutually exclusive in the way they are defined here. A private deal, for example, may be classified as either cross-border or domestic. The results in Table 1 are important for several reasons. First of all, it confirms the importance of further research into deals that are not public, since only a very small fraction of the number of deals each year is public.

The distribution in terms of deal type is also very similar to that obtained in previous research. For example, Strömberg (2008) finds that 5.8% of all deals LBO deals globally from 2001 through 2007 are public-to-private, 52.2% are private, 26.1% are divisional and 13.5% are secondary. The results in table 1 are similar although the percentage of divisional buyouts is significantly lower in this sample and the percentage of secondary buyouts is somewhat higher and closer to that obtained by Boucly et al. (2011).

46% of the buyouts are categorized as cross-border, meaning that the target and the buyer have different countries of origin in 46% of the cases. Since all targets are Swedish

in this study, it essentially means that the buyers are non-Swedish in 46% of the cases, which is comparable, although somewhat higher, than what has been found in previous studies (e.g. Scellato and Ughetto, 2012).

Table 1

Percentage distribution of buyouts over type and year.

The total number of deals is 114.

Public, Private, Secondary and Divisional show the percentages and the total number of deals belonging to the respective category for each year studied. Total across categories are shown in the vertical column furthest to the right while totals over years are shown in the bottom row.

	2006	2007	2008	2009	Total
Public (%)	0%	6%	13%	0%	5%
Number of deals	0	2	4	0	6
Private (%)	50%	59%	52%	68%	57%
Number of deals	14	19	17	15	65
Secondary (%)	32%	16%	10%	18%	19%
Number of deals	9	5	3	4	21
Divisional (%)	18%	19%	26%	14%	19%
Number of deals	5	6	8	3	22
Cross-border	46%	53%	35%	50%	46%
Number of deals	13	17	11	11	
Total	25%	28%	27%	19%	

6.2 Profitability impact of buyouts

It was hypothesized that profitability of the sample of buyouts as a whole would increase in the post-buyout period and that such increases in profitability would be concentrated in firms that were not likely to have been credit constrained prior to the crisis. The reason for this was that for such firms, reduction of agency costs and mentoring- and parenting advantages were seen as the major sources of value creation, and both these should tend to increase the profitability of the target firm. For the other type of buyouts, both mentoring- and parenting advantages and growth through reduced credit constraints were seen as the main sources of value creation. This, combined with the fact that there may be a negative relation between growth and profitability in the short run, leads to an ambiguous effect on profitability of such

buyouts in the short run. Since there is no theoretical (or empirical) ground to base an hypothesis regarding which effect is larger, the hypothesis is simply that increases in profitability are concentrated in firms not likely to have been credit constrained.

Table 2 shows the result of estimating equation 1 on the entire sample of buyouts using as dependent variables ROA based on EBITDA and Net income, respectively, and ROS based on EBITDA and Net Income, respectively.

Table 2

Sample of LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. ROA is EBITDA and Net Income scaled by assets, respectively. ROS is EBITDA and Net Income scaled by assets, respectively. Other variables are self-explanatory.

All LBOs

	ROA (EBITDA-based)	ROA (Income based)	ROS (EBITDA based)	ROS (Income based)
Postfirm	-0.05	-0.05	-0.01	0.05
Standard error	0.02	0.02	0.01	0.04
t	-2.96	-2.67	-0.68	1.27
p > abs(t)	0.000***	0.008***	0.500	0.204
Post	-0.02	-0.02	-0.02	-0.04
Standard error	0.01	0.01	0.01	0.02
t	-2.99	-2.62	-3.02	-2.65
p > abs(t)	0.000***	0.009*	0.000***	0.01***
R-square	0.06	0.04	0.01	0.03
Number of observations	3277	3527	3278	3534

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

For the aggregate sample, there is a clear decrease in ROA based on both EBITDA and Net Income in the post-buyout period which contrasts much of the previous evidence presented above although it is consistent with the evidence presented by Guo et al. (2011). This decrease is significant at the 1% level and economically meaningful. The sample ROA average based on EBITDA is 0.152 with a standard deviation of 0.164, which implies a decrease in ROA for the targets in the post-buyout period of approximately 0.3 standard deviations.

The effect on ROS is less clear. The coefficient for the EBITDA-based ROS is negative while the Net Income-based is positive. None of them are statistically significant and

profitability in terms of profit margins therefore, on average in the aggregate sample, do not seem to develop differently between targets and control-firms in the post-buyout period. Again, this contrasts to most previous studies, which have generally found a positive margin development following the buyout, and the reasons for these divergent results will be discussed in depth below.

It is interesting that coefficients for both ROA measures are significantly negative while the ROS measures are insignificant. This indicates that most of the negative profitability effect in column 1 and 2 of table 2 comes from increases in assets and not in EBITDA or Net Income. This will be examined and discussed in depth below.

In general, these results contradict the hypothesis of increasing profitability of target firms in the post-buyout period. To provide an informed discussion of why this is the case, the two different categories of buyouts must be examined separately.

Table 3

Sample of privately held LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. ROA is EBITDA and Net Income scaled by assets, respectively. ROS is EBITDA and Net Income scaled by assets, respectively. Other variables are self-explanatory.

Private LBOs

	ROA (EBITDA-based)	ROA (Income based)	ROS (EBITDA based)	ROS (Income based)
Postfirm	-0.08	-0.09	-0.03	-0.03
Standard error	0.02	0.03	0.02	-0.02
t	-3.31	-3.41	-1.89	-1.96
p > abs(t)	0.001***	0.001***	0.059*	0.051*
Post	-0.01	-0.01	-0.01	-0.02
Standard error	0.01	0.01	0.01	0.01
t	-0.98	-1.09	-1.39	-1.61
p > abs(t)	0.330	0.278	0.170	0.110
R-square	0.07	0.05	0.04	0.05
Number of observations	1841	1975	1841	1978

* Indicates significance at the 10% level

*** Indicates significance at the 1% level

Table 3 presents the same analysis with the same set of dependent variables using the sub-sample of private LBOs, i.e. those classified in this study as having faced credit constraints in the pre-buyout period with high probability. Table 4 again presents the same analysis with the same set of dependent variables, now using the sub-sample of LBOs classified as having faced credit constraints in the pre-buyout period with low probability, i.e. public-to-private buyouts, divisional buyouts and secondary buyouts.

From table 3 it is clear that profitability for private buyouts tend to decrease significantly in the post-buyout period relative to peers. ROA on average decreases by 8 percentage points which is approximately 0.5 standard deviations. This is significant at the 1% level. Profit margins, as measured by the two ROS variables, also tend to deteriorate relative to peers in the post-buyout period. The decrease in ROS based on EBITDA, however, constitutes only 0.2 standard deviations and is therefore of somewhat lower economic significance. Furthermore, the coefficients for the two ROS measures are only significant at the 10% level.

Table 4

Sample of public, divisional and secondary LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. ROA is EBITDA and Net Income scaled by assets, respectively. ROS is EBITDA and Net Income scaled by assets, respectively. Other variables are self-explanatory.

Public, Divisional and Secondary LBOs

	ROA (EBITDA-based)	ROA (Income based)	ROS (EBITDA based)	ROS (Income based)
Postfirm	-0.02	-0.01	0.02	0.16
Standard error	0.03	0.03	0.02	0.09
t	-0.77	-0.10	0.97	1.81
p > abs(t)	0.442	0.917	0.340	0.072*
Post	-0.04	-0.03	-0.02	-0.07
Standard error	0.01	0.00	0.01	0.03
t	-3.30	-2.83	-2.74	-2.16
p > abs(t)	0.000***	0.005***	0.01***	0.03***
R-square	0.05	0.03	0.01	0.08
Number of observations	1436	1552	1437	1556

* Indicates significance at the 10% level

*** Indicates significance at the 1% level

In table 4, neither of the ROA measures nor the EBITDA-based ROS measure are statistically significant, although the income-based ROS measure is positive and significant at the 10% level. The increase in the income-based ROS in the post-buyout period constitutes approximately 0.25 standard deviations.

In general, the evidence presented above has shown that on an aggregate level, there is no indication of increasing profitability following a buyout. In contrast, ROA tends to decrease after the buyout. For private-to-private buyouts, ROS decreases too. For public-to-private, divisional and secondary buyouts, however, there is no significant effect on ROA but there is indication of improving margins in the post-buyout period. In summary, this evidence supports hypothesis 2 but not hypothesis 1.

The finding that profitability tends to decrease for private transactions following a buyout is interesting and as discussed above contradicts most results obtained in previous research. There may be several theoretically grounded explanations for this, however.

For example, as discussed above, there may be a short run tradeoff between profitability and growth, since growth requires costly investment. In this case, firms that have growth opportunities and that have previously been unable to grow because of credit constraints may exploit these opportunities and experience short-run decreases in profitability. This reasoning constitutes the logic behind hypothesis 2. However, in order for profitability to develop negatively relative to peers, any such effect caused by investments in growth must then also be large enough to offset any positive profitability effect resulting from parenting and mentoring advantage. This has not been the case in most previous studies, although as discussed above, very few studies explicitly differentiate between the different categories of buyouts and therefore comparing this specific category of buyouts to previous research is difficult. Furthermore, some recent studies have shown similar results. For example, as discussed above, Scellato and Ughetto (2012) find that LBO targets underperform in terms of profitability but outperform in terms of growth relative to their peers in the post-buyout period.

There are some potential alternative explanations for the negative profitability effect. For example, the global financial crisis of 2008 and onwards may have an impact and there are at least two possible explanations of why.

One of the main factors described in theory as driving profitability increases in buyout targets is the high debt level often used in buyout transactions, which improves managerial incentives. To the extent that the financial crisis may have reduced access to debt financing, any positive effect on profitability may be reduced as a consequence, although such an effect should not cause buyout targets to perform abnormally poor compared to control firms.

Another potential explanation, also related to the high level of debt financing, is increased cost of financial distress caused by the economic downturn. Financial distress costs may decrease a firm's profitability through impairing its ability to conduct business, for example through loss of key suppliers, employees or customers (Jaffe et al., 2003). To the extent that buyout targets are more levered than control firms, this would disproportionally cause declining profitability for target firms relative to control firms. Indeed, it has been shown in previous research that the probability of bankruptcy (and thus expected costs of financial distress) is higher for private equity backed firms (e.g. Hotchkiss et al., 2014). These potential causes of declining profitability will be discussed and tested for further later in the paper.

6.3 Growth impact of buyouts

Table 5 shows equation 1 fitted on the entire sample using the logarithm of revenue, EBITDA, number of employees and total assets as dependent variable.

On average, growth in revenue, employees and assets is positive and statistically significant following the buyout. Growth in assets and employees is inconsistent with most previous evidence, but consistent with some of the most recent evidence, for example Boucly et al. (2011). One of the reasons, as hypothesized above, may be that various types of buyouts are included in this study while most earlier studies contain only public buyouts, where most of the gains seem to come from reducing wasteful investment caused by managerial incentive misalignment in public firms.

To further examine this explanation and conduct a formal test of hypothesis 3, table 6 and 7 show the same analysis again performed on the separate sub-sample of firms with a high and low probability of being credit constrained before the buyout, respectively.

Table 5

Sample of LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. Other variables are self-explanatory.

All LBOs

	ln (Revenue)	ln (EBITDA)	ln (Employees)	ln (Assets)
Postfirm	0.13	0.10	0.11	0.24
Standard error	0.05	0.09	0.04	0.06
t	2.52	1.14	2.89	4.42
p > abs(t)	0.012**	0.254	0.004***	0.000***
Post	-0.05	-0.08	-0.01	-0.06
Standard error	0.02	0.05	0.01	0.02
t	-2.49	-1.60	-0.84	-3.36
p > abs(t)	0.013**	0.110	0.401	0.000***
R-square	0.15	0.04	0.09	0.20
Number of observations	3534	2959	3470	3528

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

Table 6 shows that private buyouts tend to grow significantly faster than their peers in terms of revenue, employees and assets. In fact, revenues, employees and assets tend to increase by 21%, 21% and 29% respectively relative to the control group in the post-buyout period. These coefficients are statistically significant and clearly of economic importance, although the much higher increase in assets again causes some worries that some of the effect may come from asset write-ups at the time of the transaction. These results are similar in magnitude to those obtained by Boucly et al. (2011).

Table 7 shows that there are no significant changes in revenue, EBITDA and employees for non-credit constrained buyouts, while assets growth in the post-buyout period is statistically significant and highly economically significant. Again, however, there may be reason to believe that some of this effect may come from asset write-ups. To examine this and assess the viability of changes in total assets as a measure of investment or asset growth, the change in the logarithm of total assets between two years before the

buyout and each year thereafter up to three years after the buyout was computed for all LBO targets and the corresponding targets. The average change for every year for the control firms of each target was then subtracted from the change in the targets total assets for each year. Resulting is the average cumulative abnormal target development in the logarithm of total assets, which is shown for the private targets in figure 1 and for the public, divisional and secondary targets in figure 2. Although no conclusive evidence can be drawn from this, it is clear that for the second category, the entire increase in assets come in the first year, after which assets start declining again. This may indicate that a large part of it is simply caused by asset write-ups at the time of the transaction and that changes in assets may therefore be an inappropriate measure of investment when studying buyouts. For private targets, assets increase in the two first years after the buyout and decline slightly in the third.

Table 6

Sample of privately held LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. Other variables are self-explanatory.

Private LBOs

	ln (Revenue)	ln (EBITDA)	ln (Employees)	ln (Assets)
Postfirm	0.21	0.08	0.21	0.29
Standard error	0.07	0.12	0.05	0.07
t	2.92	0.61	4.02	3.85
p > abs(t)	0.004***	0.544	0.000***	0.000***
Post	-0.08	0.01	-0.04	-0.07
Standard error	0.02	0.07	0.02	0.03
t	-3.57	0.11	-2.17	-2.93
p > abs(t)	0.000***	0.916	0.03**	0.003***
R-square	0.21	0.06	0.15	0.21
Number of observations	1978	1671	1957	1976

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

This, combined with the fact that revenue and employees grow significantly in the post-buyout period makes the growth-outperformance result for private buyouts very robust. However, for the other category, the fact that assets decline significantly both before and after the buyout (the one exception being the actual year of the buyout), combined with

the fact that revenues, EBITDA and employment do not change significantly, this strongly indicates that these firms do not outgrow their peers following the buyout.

Table 7

Sample of public, divisional and secondary LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. Other variables are self-explanatory.

Public, Divisional and Secondary LBOs

	ln (Revenue)	ln (EBITDA)	ln (Employees)	ln (Assets)
Postfirm	0.03	0.14	-0.01	0.19
Standard error	0.07	0.13	0.06	0.08
t	0.42	1.08	-0.09	2.36
p > abs(t)	0.677	0.282	0.929	0.019**
Post	-0.02	-0.19	0.02	-0.05
Standard error	0.04	0.08	0.02	0.03
t	-0.48	-2.37	0.98	-1.72
p > abs(t)	0.630	0.02**	0.330	0.090
R-square	0.13	0.04	0.08	0.18
Number of observations	1556	1288	1513	1552

** Indicates significance at the 5% level

Potential ways of controlling and adjusting for any unwanted effect resulting from asset write-ups will be experimented with later in the paper. For now, the conclusion is that growth in revenue, EBITDA and employees are the preferred measure when studying the growth effects of buyouts. In general, the evidence presented above is very similar to that presented by Boucly et al. (2011) and is strongly supportive of hypothesis 3. It supports the idea that private LBO targets tend to be firms with growth opportunities. It may also indicate that private equity funds help target firms in taking advantage of such opportunities, for example through facilitating access to external financing, although the latter is of course not necessarily true and will be explored further later in the paper.

Given that revenue, EBITDA and employees are the preferred measures, the results also support the idea that buyouts not likely to have faced credit constraints in the pre-buyout period do not outperform their peers in terms of growth in the post-buyout period.

Figure 1
Development in cumulative excess change in the natural logarithm of total assets for target firms compared to their respective peers in the pre- and post-buyout period.

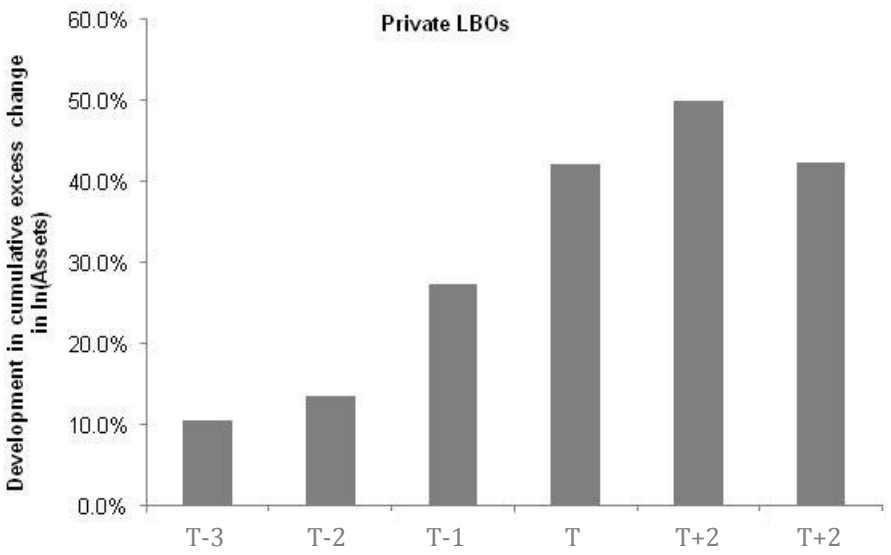
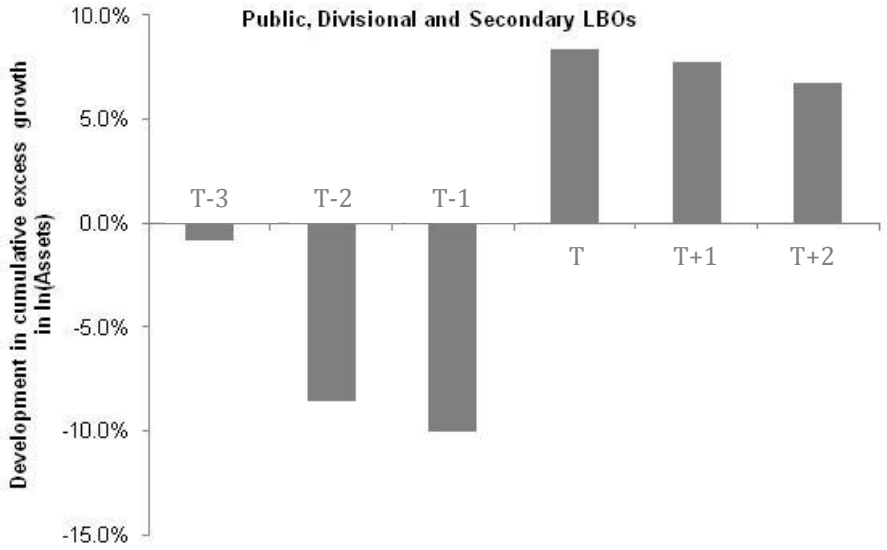


Figure 2
Development in cumulative excess change in the natural logarithm of total assets for target firms compared to their respective peers in the pre- and post-buyout period.



6.4 Operational development in cross-border buyouts

As discussed above, it has been hypothesized and confirmed in previous studies that profitability development in cross-border buyouts tend to be inferior to that of domestic buyouts since both monitoring and providing strategic advice is costly and this cost is thought to increase with physical distance. To test for any difference in operational development between domestic and cross-border LBOs, the following equation was estimated:

$$Y_{jt} = \alpha_j + \delta_t + post_{jt} + postfirm_{jt} + CB_j * post + CB_j * postfirm + \varepsilon_{jt.} \qquad (2)$$

CB is a dummy, which for LBO targets takes the value 1 if the LBO is a cross-border transaction and 0 otherwise. For control firms, the variable takes a value of 1 if the target corresponding to that control firm was the subject of a cross-border transaction and 0 otherwise. The results of this regression are shown in table 8 below.

Looking at the results in table 8, there is no indication of any incremental profitability effect, positive or negative, in cross-border buyouts relative to domestic buyouts on any of the profitability measures. This is an interesting result for several reasons. First of all, it is inconsistent with evidence presented by e.g. Scellato and Ughetto (2012), who show using a large sample of European buyouts that domestic buyouts tend to have superior profitability development compared to cross-border buyouts. Secondly, it seems inconsistent with the idea that the cost of monitoring and providing strategic advice increases with physical distance. However, there is one potential effect that may not be present to the same extent in the pooled European sample used by Scellato and Ughetto (Ibid.). Sweden is a relatively small European country and to the extent that cross-border transactions are mostly undertaken by larger funds, comparing domestic and cross-border buyouts may introduce a size-bias if those foreign funds acquiring companies in Sweden are consistently larger than most Swedish funds. The size of private equity sponsors, normally stated in terms of total assets under management, is often used as a measure of experience and has been shown in previous studies to be associated with lower bankruptcy rates (Tyková and Borell, 2012) and higher target-firm growth rates (Muelman et al., 2009).

Table 8

Sample of LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. ROA is EBITDA and Net Income scaled by assets, respectively. ROS is EBITDA and Net Income scaled by assets, respectively. CD is a dummy taking the value 1 for a target company and its corresponding control firms if the target was purchased by a foreign aquiror and 0 otherwise. Other variables are self-explanatory.

All buyouts

	ROA (EBITDA-based)	ROA (Income-based)	ROS (EBITDA-based)	ROS (Income-based)
Postfirm	-0.06	-0.05	0.00	-0.01
Standard error	0.02	0.02	0.00	0.02
t	-2.81	-2.41	-0.72	-0.48
p > abs(t)	0.005***	0.016**	0.475	0.630
Post	-0.02	-0.02	0.00	-0.01
Standard error	0.01	0.01	0.00	0.01
t	-2.29	-2.27	-0.52	-1.71
p > abs(t)	0.022**	0.024**	0.600	0.088
Postfirm * CB	0.02	0.00	0.00	0.00
Standard error	0.04	0.04	0.00	0.03
t	0.41	-0.06	1.10	0.01
p > abs(t)	0.683	0.959	0.271	0.995
Post * CB	0.00	0.00	0.00	-0.01
Standard error	0.01	0.01	0.00	0.01
t	-0.36	-0.15	-1.11	-1.60
p > abs(t)	0.721	0.883	0.269	0.111
R-square	0.06	0.04	0.12	0.13
Number of observations	3277	3527	2445	3278

** Indicates significance at the 5% level

To the extent that larger and more experienced private equity sponsors provide better strategic advice and superior monitoring, and in case foreign funds are on average larger than Swedish funds, this may distort the cross-border coefficient. Such an idea is also supported by previous research on specialized funds discussed above, which has shown that targets owned by specialized funds, which are more likely to be international, tend to outperform those of generalist funds. Unfortunately data on total assets under management are not available through Orbis or Mergermarket, although data on total assets currently under management is normally available through the website of the private equity funds and could potentially be used as a proxy for size at the time of the boyout. However, using the current size of private equity sponsors to examine performance in buyouts occurring between 2006 and 2009 may distort the data and this is of course problematic, especially if the distortion is systematic. In this case it is reason

to believe that such a distortion would be problematic, since private equity funds that have previously earned high returns are more likely to successfully raise a second fund (Scellato and Ughetto, 2012). If this is the case, using the current size to proxy for historic size is likely to overstate the historical size of those funds performing well (and understate the size of those funds performing poorly), which would cause a positively biased size-performance correlation. Therefore, such a method was seen as adding little value and was not implemented.

Based on the sample studied in this paper and the analysis performed above, hypothesis 4 is not supported.

6.5 Value creation and value redistribution

As discussed above, some scholars have argued that the largest part of gains from private equity transactions come from expropriation of stakeholders, primarily resulting from a decrease in wages that have previously been overpaid buy managers that are more loyal to employees than to shareholders. Since evidence on wage development in buyout targets has been mixed, this study proposes the hypothesis that employee expropriation may be more attractive in slow growing firms and less so in firms with attractive growth opportunities. To facilitate the test of this hypothesis, table 9 presents equation 1 fitted now using the logarithm of the average wage as the dependent variables for the aggregate sample, credit constrained LBOs, and non-credit constrained LBOs, respectively.

In summary, table 9 shows no evidence of expropriation of employees following a buyout and does therefore not initially support hypothesis 5. Average wages for non credit constrained buyouts do not seem to fall, or grow slower than peers. The effect for non credit-constrained LBOs is close to 0 and statistically insignificant. Part of the reasoning behind hypothesis 5 is somewhat supported, however, since wage growth is significantly higher in credit constrained LBOs than in Non credit-constrained LBOs. In fact, average wages for private buyouts increase by 17% compared to peers in the post-buyout period in this sample. This is highly interesting and puts into question the idea that returns to private equity funds are primarily generated by value redistribution from

employees to private equity investors. The measure of average wages used in this study is relatively crude, however, which will be discussed further below.

Table 9

Sample of LBO targets and control firms for the period 2003-2012 estimating the impact of undergoing a buyout on operating variables. on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. The dependent variable is the logarithm of the average wage in all regressions.

All LBOs

	All LBOs	**Credit constrained LBOs**	**Non credit-constrained LBOs**
Postfirm	0.11	0.17	0.00
Standard error	0.04	0.05	0.05
t	2.90	3.39	0.04
p > abs(t)	0.004***	0.001***	0.964
Post	-0.01	0.00	-0.02
Standard error	0.02	0.02	0.04
t	-0.50	-0.25	-0.53
p > abs(t)	0.619	0.803	0.598
R-square	0.14	0.20	0.09
Number of observations	2510	1501	1009

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

One potential reason why no signs of reduced wages in non credit constrained buyouts can be seen may be that grouping firms as being credit constrained with high and low probability may not provide a clear picture here. The reason why this division is used in most parts of the paper is because it may provide a good proxy of whether a firm has unexploited growth opportunities or not, and therefore a good predictor of growth and operational development in the post-buyout period. This does not necessarily need to be the case for wage. For public buyouts, the major theoretical explanation of value creation and value distribution is reduction of agency costs. Since managers in public corporations may have an incentive to overpay employees, wage reductions should be particularly likely following a public buyout. The argument behind hypothesis 5 for the other two categories of buyouts, secondary and divisional, was that firms which are not credit constrained are less likely to have unexploited growth potential and are more likely to focus on profitability improvements. This has been supported by evidence presented above, but the likelihood of seeing wage reductions following a public buyout

may be even higher than for secondary and divisional buyouts, given the agency cost argument presented above. Therefore, equation 1 was estimated for private, public, secondary and divisional LBOs separately, the results of which is shown in table 10.

Table 10

Sample of LBO targets and control firms for the period 2003-2012 estimating the impact of undergoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. The dependent variable is the logarithm of the average wage in all regressions.

All LBOs

	Private LBOs	Public LBOs	Divisional LBOs	Secondary LBOs
Postfirm	0.17	-0.30	0.00	0.13
Standard error	0.05	0.07	0.05	0.08
t	3.39	-4.23	0.07	1.59
p > abs(t)	0.001***	0.000***	0.942	0.117
Post	0.00	0.04	0.00	-0.09
Standard error	0.02	0.07	0.04	0.09
t	-0.25	0.59	-0.09	-1.05
p > abs(t)	0.800	0.560	0.930	0.300
R-square	0.20	0.40	0.09	0.11
Number of observations	1501	127	503	379

*** Indicates significance at the 1% level

Table 10 provides strong support for this hypothesis and shows that while the average wage tends to increase faster than the peer group average for private LBOs, wages for public LBOs tend to decrease relative to the peer group in the period following the buyout. This effect is significant at the 1% level and highly economically significant – average wages for public buyouts in this sample falls with 30% relative to peers. This is consistent with a situation where managers in publicly owned firms overpays employees and where part of the gain from the LBO to the equity holders come from a redistribution of wealth rather than from wealth creation. It is also consistent with previous evidence, such as that presented by Amess and Wright (2007). For divisional and secondary LBOs, there are no significant wage effects. The magnitude of the effects

does raise some concerns, however. Leslie and Oyer (2008) show that top management in target companies following a public-to-private buyout tend to have between 10% and 44% lower wages than top management at comparable listed companies. Some of this is due to a size effect and when adjusting for size, top management on average earns 16% less than their counterparts in public corporations (Ibid.). The estimates in the regressions presented in this paper are roughly adjusted for size since control companies are matched as closely as possible on size and profitability. However, as discussed in part 5, there is a trade-off between the number of control companies and their relevance, which resulted in the +/- 50% bracket in terms of revenue when constructing the peer group. This means that some size effects may still distort the results. The reason why size is of high importance is that various studies have confirmed wages to be higher in larger firms (e.g. Bayard and Troske, 1999; Pedace, 2010), with some studies showing wage differentials between the smallest and the largest categories of firms to be as high as 35% (Ashenfelter and Card, 1999). Taking into account that private equity funds may target companies where potential for improvement is high and where agency problems may therefore be more severe than on average, a relatively high wage reduction following a public buyout is not unexpected.

It should also be noted that there are some potential problems with this way of measuring wage effects and employee expropriation. For example, noise resulting from the implementation of changes, which are simply strategic, may impact the results. Some authors, for example, have argued that LBOs tend to increase the strategic focus of target firms (e.g. Kaplan and Strömberg, 2009). If this is the case, it may be the case that target firms have higher propensity to outsource peripheral activities and if these activities differ in their skill-intensity from headquarter activities or core activities, the effect may be a change in the average wage although it does not automatically imply value redistribution between employees and equity holders. Therefore, the results above should primarily be considered as indicative. Unfortunately, data availability inhibits any deeper analysis of this potential problem.

In summary, the evidence presented above is consistent with the hypothesis that different types of LBOs create value through different channels. The evidence suggests that targets with a high probability of having been credit constrained prior to the LBOs

focus more on pursuing growth in the post-buyout period, while firms with low such probability focus more on generating value through cutting costs. This evidence is consistent both with the incentive-intensity hypothesis, parenting and mentoring effects, and the theory of value creation in LBOs through alleviation of credit constraints.

The results are also highly valuable in the discussion of value creation and value redistribution as it helps reconcile evidence presented by e.g. Lichtenberg and Siegel (1990) and Boucly et al. (2011). It was shown that wage reduction in buyouts seems to be concentrated in the firms, which were ex-ante hypothesized to be more likely both to overpay their employees and to focus on profitability in the post-buyout period, namely public LBOs. At the same time, private LBOs show significantly higher wage growth than the peer group. This is consistent with the theoretical notion that managers of publicly listed firms have an incentive to overpay their employees and that private equity ownership results in a correction of this and thus a transfer of wealth between employees and shareholders. It is also consistent with the idea that different types of LBOs are guided by different strategic considerations.

6.6 Buyout impact on efficiency

As discussed previously, efficiency and profitability are closely interlinked and previous research on the impact on both efficiency and profitability of leveraged buyouts has partly given inconsistent results, although it seems that buyouts on average tend to increase both profitability and efficiency.

One reason for the inconsistent results is, as also discussed at length above, that previous research has not differentiated between different types of buyouts. Again, if a firm invests in working capital to position itself for growth, working capital levels (which is a measure of efficiency) may rise and efficiency go down. Therefore, growth and efficiency may be negatively correlated in the short run. This would affect those targets we expect to outperform their peers in terms of growth, namely those that have faced credit constraints prior to the buyout with a high probability. Therefore, it was hypothesized that increases in efficiency would be concentrated among firms that have not faced such constraints.

Table 11, 12 and 13 shows equation 1 performed using working capital scaled by sales, asset turnover and sales per employee as dependent variables for the entire sample of buyouts, credit constrained buyouts, and non-credit constrained buyouts, respectively. From table 11 it is clear that average working capital for the aggregate sample tends to decrease in the post-buyout period while Table 12 and Table 13 shows that this effect is concentrated in public, divisional and secondary buyouts, or non credit-constrained LBO targets. This is precisely in line with hypothesis 6 and supports the idea that large decreases in working capital relative may be more difficult in anticipation of future sales growth and that this is the focus of more mature companies. The general reduction in working capital levels for the aggregate sample is also consistent with most previous research and consistent with the idea of both increased operational efficiency through reduced agency costs and through mentoring- and parenting advantages. The reduction in working capital as a percentage of sales is significant at the 1% level, but is of relatively low economic significance since it implies a decrease in working capital levels for non-credit constrained firms of approximately 0.2 standard deviations with respect to the sample. None of the sales per employee coefficients are statistically significant although all are positive. Asset turnover is negative and statistically significant at the 10% level for public, divisional and secondary buyouts. This is interesting as it indicates deteriorating efficiency, which contrasts the coefficients on working capital and sales per employee, especially the former, which is negative and highly significant. There are several potential explanations for this although the most likely one is probably, given the indications obtained from figure 2, that it is again at least partly a result of asset write-ups. This seems especially likely since the sales per employee measure is positive and insignificant. Further robustness checks to work around the problem of potential asset write-ups will be explored later in the paper. However, given the general problems established above with using asset-based measures, non-asset based measures are the preferred measures in this study. Therefore, the hypothesis of increasing efficiency in the post-buyout period is considered partly supported.

Table 11

Sample of LBO targets and control firms for the period 2003-2012 estimating the impact of undergoing a buyout on operating variables. on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. WC/Sales is working capital scaled by sales. Asset turnover is sales scaled by total assets. Other variables are self-explanatory.

All LBOs

	WC/Sales	ln (Sales/Employee)	Asset Turnover
Postfirm	-0.01	0.04	0.20
Standard error	0.01	0.03	0.43
t	-1.73	1.05	0.46
p > abs(t)	0.084*	0.292	0.649
Post	0.00	-0.05	-0.18
Standard error	0.00	0.02	0.15
t	-0.43	-3.30	-1.20
p > abs(t)	0.670	0.000***	0.231
R-square	0.05	0.10	0.01
Number of observations	3514	3469	3527

* Indicates significance at the 10% level

*** Indicates significance at the 1% level

Table 12

Sample of LBO targets and control firms for the period 2003-2012 estimating the impact of undergoing a buyout on operating variables. on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. WC/Sales is working capital scaled by sales. Asset turnover is sales scaled by total assets. Other variables are self-explanatory.

Private LBOs

	WC/Sales	ln (Sales/Employee)	Asset Turnover
Postfirm	0.00	0.02	0.50
Standard error	0.01	0.05	0.75
t	0.02	0.46	0.66
p > abs(t)	0.982	0.646	0.509
Post	0.00	-0.04	-0.31
Standard error	0.01	0.02	0.27
t	-0.41	-2.15	-1.14
p > abs(t)	0.680	0.03***	0.254
R-square	0.04	0.12	0.01
Number of observations	1970	1956	1975

*** Indicates significance at the 1% level

Table 13

Sample of LBO targets and control firms for the period 2003-2012 estimating the impact of undergoing a buyout on operating variables. on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. WC/Sales is working capital scaled by sales. Asset turnover is sales scaled by total assets. Other variables are self-explanatory.

Public, Divisional and Secondary LBOs

	WC/Sales	ln (Sales/Employee)	Asset Turnover
Postfirm	-0.03	0.05	-0.20
Standard error	0.01	0.04	0.11
t	-2.82	1.16	-1.80
p > abs(t)	0.005***	0.247	0.073*
Post	0.00	-0.06	-0.03
Standard error	0.01	0.02	0.09
t	-0.17	-2.53	-0.33
p > abs(t)	0.860	0.01**	0.741
R-square	0.13	0.07	0.02
Number of observations	1544	1513	1552

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

7 Alternative specifications and robustness checks

7.1 Alternative measurements

The main results of this paper so far is that private LBOs which are likely to have been credit constrained prior to a buyout grow faster than peers in the post-buyout period, while non-private buyouts which are not likely to have been credit constrained prior to the buyout have abnormal positive operational development in efficiency and profitability compared to peers, although support for the latter claim has been relatively weak. In studying these effects, this paper has primarily relied on those measures used to study the operational impact of buyouts in previous literature. There are potential problems with some of these measures, however, and some of these problems may be mitigated through enriching the analysis with a broader range of variables.

For example, it was concluded that EBITDA was the optimal profitability measure since it is immune to any depreciation effects from asset write-ups while at the same time being capital structure neutral. However, EBITDA also has the unfortunate effect of causing a quite severe decrease in the sample size since a large number of companies do

not report EBITDA. This decrease in sample size may or may not be systematic – for example, if larger firms are more likely to report EBITDA the EBITDA profitability measure and the corresponding regressions will be biased towards large firms. To reduce any such impact, ROS and ROA based on net income have also been used although these measures have the problem of not being capital structure neutral and being affected by any changes to the depreciation schedule resulting from asset write-ups. There are several areas where complementary measures could be used to get around some of the problems inherent in using the size and profitability variables most often used. In addition, alternative measures may help both in providing explanations to why results may not be as hypothesized and in providing additional robustness when results are as hypothesized. One example discussed extensively above, is that the asset base of target companies is impacted by asset write-ups and goodwill recognition at the time of the transaction. Such effects are largely ignored in previous studies of private equity targets' operational development in the post-buyout period but may be a significant source of bias, as clearly indicated in figure 2.

To test for the potential impact of goodwill recognition, additional regressions were performed using the two ROA measures based on tangible assets rather than total assets. Using tangible assets has the advantage of excluding goodwill and thereby reducing any mechanical increase in assets that is solely an effect of the company being bought. Unfortunately using only tangible assets does not solve the problem of asset write-ups at the time of the transaction. In addition, intangible assets do not only consist of goodwill but are also to a varying degree composed of assets that are part of companies' productive and cash flow generating activities and that should therefore in principle be incorporated into profitability measures when comparing different companies. Therefore, these additional regressions should merely be seen as complementing those presented previously in the study.

Table 14, 15 and 16 shows the results of these regressions on an aggregate level, for the LBOs categorized as credit constrained, and for those LBOs categorized as less likely to be credit constrained, respectively. The results are highly interesting. First of all, it is clear that abnormal asset growth is still positive and significant both on an aggregate level and for both groups of buyouts individually. However, as expected, the coefficient

for credit constrained buyouts is larger and has a much higher t-statistic (i.e. is significant at a lower level), which indicates that growth as a channel of value creation is more important for companies that are likely to be credit constrained, which is the essence of the credit constraint hypothesis. It should also be noted that when using only tangible assets in the denominator, none of the profitability measures differ significantly from the control firms in this sample. This indicates that a mechanically higher asset base caused by goodwill recognition may indeed have caused some of the deteriorating profitability in the original regressions above. As noted, however, intangible assets may also be part of firms' productive activities and therefore these results should be interpreted with some caution. These results indicate that the abnormal increase in assets for public buyouts compared to peers is not caused by goodwill-recognition, although it is still, of course, highly likely that it is, at least partly, caused by asset write-ups. Since total assets are part of asset turnover, which was used to study the efficiency impact of buyouts, regressions were also performed using asset turnover based only on tangible assets. The results are shown in table 17. The results show that when using asset turnover based on only tangible assets as a dependent variable, the decrease in asset turnover is no longer significant. This supports the idea that the decrease may to be caused by asset write-ups and goodwill recognition.

Table 14

Sample of LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. ROTA is return on tangible assets based on Income and EBITDA, respectively. Other variables are self-explanatory.

All LBOs

	ROTA (Income-based)	ROTA (EBITDA-based)	Tangible assets
Postfirm	2.45	1.54	0.20
Standard error	3.45	4.45	0.06
t	0.71	0.35	3.50
p > abs(t)	0.478	0.729	0.001***
Post	-17.77	-30.41	-0.01
Standard error	17.01	22.64	0.03
t	-1.04	-1.34	-0.43
p > abs(t)	0.297	0.180	0.667
R-square	0.03	0.04	0.03
Number of observations	3465	3250	2445

*** Indicates significance at the 1% level

Table 15

Sample of private LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. ROTA is return on tangible assets based on Income and EBITDA, respectively. Other variables are self-explanatory.

Private LBOs

	ROTA (Income-based)	ROTA (EBITDA-based)	ln(Tangible assets)
Postfirm	3.41	6.15	0.24
Standard error	5.15	8.12	0.08
t	0.66	0.76	3.17
p > abs(t)	0.509	0.449	0.002***
Post	-21.48	-49.51	-0.01
Standard error	29.07	37.66	0.04
t	-0.74	-1.31	-0.31
p > abs(t)	0.460	0.190	0.756
R-square	0.06	0.05	0.06
Number of observations	1940	1822	1941

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

Table 16

Sample of public, divisional and secondary LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. ROTA is return on tangible assets based on Income and EBITDA, respectively. Other variables are self-explanatory.

Public, divisional and secondary LBOs

	ROTA (Income-based)	ROTA (EBITDA-based)	ln(Tangible assets)
Postfirm	1.65	-3.09	0.15
Standard error	4.54	2.28	0.08
t	0.36	-1.35	1.74
p > abs(t)	0.716	0.178	0,082*
Post	-7.44	-1.87	-0.02
Standard error	6.27	2.39	0.04
t	1.19	-0.78	-0.44
p > abs(t)	0.236	0.435	0.657
R-square	0.07	0.03	0.03
Number of observations	1525	1428	1525

* Indicates significance at the 10% level

Table 17

Sample of public, divisional and secondary LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. Non-CC LBOs are LBOs classified as being credit constrained with low probability prior to the buyout and includes public, divisional and secondary buyouts. CC LBOs are LBOs classified as being credit constrained with high probability prior to the buyouts and include private buyouts. Asset turnover calculated using tangible assets only is the dependent variable in all regressions in this table.

All LBOs

	All LBOs	**non-CC LBOs**	**CC LBOs**
Postfirm	-64.21	-77.52	-48.26
Standard error	52.52	48.07	89.02
t	-1.22	-1.61	-0.54
p > abs(t)	0.220	0.108	0.588
Post	-109.06	61.05	-227.28
Standard error	116.66	57.88	194.11
t	-0.93	1.05	-1.17
p > abs(t)	0.350	0.293	0.243
R-square	0.05	0.02	0.06
Number of observations	3465	1525	1525

7.2 Debt levels, target solvency and profitability

One of the hypotheses of this paper was that given the idea that growth and profitability can sometimes be incompatible goals in the short run, firms which have previously been credit constrained will focus more on growth in the post buyout period while firms that have not will tend to focus on increasing efficiency and profitability. This has been supported through the evidence above, where it was shown that profitability and efficiency increases were concentrated in firms that were less likely to be credit constrained in the pre-buyout period while post-buyout growth, when looking at the preferred variables, was concentrated in private LBO targets with higher probability of having been credit constrained prior to the buyout. In fact, those LBO targets that had been credit constrained with a high probability showed a significant decline in profitability. This indicates that the any short-term detrimental effect on profitability resulting from the growth outperformance dominates any positive parenting and mentoring effects. This is not inconsistent with theory since, as mentioned above, there is no clear theoretical grounds on which to, ex-ante, hypothesize regarding which effect should be dominating. However, most previous studies have shown profitability

increases for buyouts on the aggregate as well, so although the result is consistent with theory it is not necessarily consistent with earlier evidence. It is of course also the case that while profitability and growth may be incompatible to a certain extent in the short run, this does not necessarily imply that abnormal growth will lead to abnormally negative profitability development. In other words, even though profitability has been shown to develop negatively for private LBOs in the sample period, it has not been shown to be an effect of the excess growth, even if this is the most appealing theoretical reason. Furthermore, the development in profitability for public, divisional and secondary LBOs was insignificant for both ROA measures and only significant at the 10% level for the income-based ROS measure. Although these results do support an increase in profitability for non-credit constrained buyouts, the support is much weaker than in previous research.

One potential source of discrepancy compared to earlier studies that has not been taken into account in the formation of the hypotheses is the fact that a large part of the sample period lies within the global financial crisis. This fact is of course only relevant in case it affects private equity backed firms disproportionally compared to control firms, and two potential explanations for why this may be the case have been shortly discussed above, and relate to leverage. First of all, since the high debt levels in leveraged buyouts has been argued to be one of the main value drivers through the higher incentives provided by management by debt to avoid bankruptcy, and its effect on agency costs through mitigating the free cash flow problem, lower levels of debt in buyouts may be associated with inferior profitability performance. To the extent that debt financing is less accessible during the financial crisis, the incentive and free cash flow effects of debt may be limited. This would primarily be relevant for those buyouts that were publicly owned prior to being bought. In addition, since higher debt levels lead to higher probability of bankruptcy, the generally high debt levels in buyouts may increase bankruptcy costs which may lead to decreased profitability. Even if the firm does not in fact go bankrupt, the expectation of bankruptcy may lead to impaired ability to conduct business through hampering conduct with employees, customers and suppliers, which may lead to lower profitability.

Both these factors may theoretically affect the performance of leveraged buyout targets during a financial crisis although it is somewhat problematic to test for the effects separately. If the first case is true, then higher performance should be expected for those firms where leverage is higher. If the second case is true, then higher performance may be expected for those firms where leverage is lower. To see which effect dominates, the following regression is run:

$$Y_{jt} = \alpha_j + \delta_t + post_{jt} + postfirm_{jt} + post_{jt} * NIBD_j + postfirm_{jt} * NIBD_j + \varepsilon_{jt}. \quad (3)$$

NIBD stands for net interest bearing debt, which is defined as the sum of short- and long-term debt less cash and cash equivalents scaled by EBITDA. This regression was only run using the EBITDA-based measures of profitability since any given debt level as defined above will decrease any income-based measure of profitability by definition. Therefore, using income-based profitability variables to test for any incremental effect of debt levels do not make sense. It can be seen in table 18 that the NIBD coefficient is neither economically or statistically significant. Therefore, it does not seem that the generally higher debt levels of private equity companies have had any adverse impact on their profitability during the financial crisis.

However, bankruptcy costs could be expected to be relatively limited for targets with low leverage, while the impact on profitability resulting from the outsourced monitoring and forced payments of free cash flows should be present already at low levels of leverage. Therefore it could be the case that there is a nonlinear relationship between debt and profitability for private equity companies. To test for this, the regression was also performed including a squared NIBD-term. If bankruptcy costs are insignificant at low levels of leverage, only the positive incentive and free cash flow effects of leverage should impact target firm performance, while for higher levels of leverage bankruptcy costs would be expected to have a larger impact. None of the coefficients were significant in this regression either. Based on these results, there are no indications that the profitability of private equity owned companies were more heavily affected by the financial crisis due to their generally higher leverage. Both regressions were also performed separately for private and public, divisional and secondary buyouts, as well as for all four categories separately, but without the NIBD coefficient being significant.

Table 18

Sample of LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. ROA is EBITDA and Net Income scaled by assets, respectively. ROS is EBITDA and Net Income scaled by assets, respectively. NIBD 0stands for net interest bearing debt and is scaled by EBITDA. Other variables are self-explanatory.

All buyouts

	ROA (EBITDA-based)	ROS (EBITDA-based)
Postfirm	-0.06	-0.01
Standard error	0.02	0.01
t	-2.97	-0.78
p > abs(t)	0,003***	0.438
Post	-0.02	-0.02
Standard error	0.01	0.01
t	-2.64	-2.65
p > abs(t)	0,008***	0.008**
Postfirm * NIBD	0.00	0.00
Standard error	0.00	0.00
t	-1.42	-0.19
p > abs(t)	0.157	0.846
Post * NIBD	0.00	0.00
Standard error	0.00	0.00
t	2.21	2.21
p > abs(t)	0,028**	0,027**
R-square	0.06	0.01
Number of observations	2445	2445

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

Another way to test more directly any impact that the financial crisis may have had on private equity backed firms is of course to test for sub-period robustness dividing the sample into two subsamples, one before the start of the financial crisis and one after. The problem with this methodology for this particular sample is that it would lead to a very important decrease in observations and more importantly a very large decrease in the number of pre-buyout observations for post-crisis period and a very large decrease in the number of post-buyout observations in the pre-buyout period. Since data through the Orbis database, for unlisted firms, is available only for the 10 latest years, the extension of the sample period necessary to perform such a test was not possible and therefore sub-sample robustness could not be tested for in this manner.

7.3 Credit constraints and growth in private LBOs

One of the main hypotheses of this paper has been that private equity firms may help alleviate credit constraints for private targets, which allows them to finance growth that was not possible prior to the transaction. This hypothesis is supported by the fact that private LBOs tend to grow faster than peers in the post-buyout period while other types of buyouts do not. It should be noted though, that excess growth need not necessarily come from alleviated credit constraints, although it is an appealing theoretical explanation of the excess growth showed for private firms. However, it may be that mentoring and parenting advantages brings about strategic opportunities that help the buyout targets growth faster than their peers. The objective of this section is to further test the idea that growth outperformance for private buyout targets is caused by alleviated credit constraints.

7.3.1 Credit constraints and asymmetric information

The hypothesis that excess growth in private LBOs comes from alleviated credit constraints will be tested using two separate procedures below. First of all, if alleviation of credit constraints is the main source of excess growth in private LBOs, such excess growth should be higher in industries where credit constraints are high, and low or non-existing in industries where credit constraints are low. According to Nofsinger and Wang (2009), one source of credit constraints can be information asymmetries between investors and managers. To the extent that private equity owners have previous transaction and industry experience and can enhance the credibility of the target company in the eyes of providers of external financing, it may assist in decreasing information asymmetries as such, and also in decreasing their impact in terms of resulting credit constraints.

The effect described above should be higher in industries where information asymmetries are higher. To test this sub-hypothesis, a measure of information asymmetries was constructed at the industry level. This measure was constructed based on corporate R&D spending, which has previously been used as a proxy for information asymmetries in corporate finance and corporate governance research (e.g. Aboody and Lev, 2000). For each Swedish firm with more than 100 employees at any time in the

period between 2004 and 2012 and where data on R&D expenditure was available, yearly R&D expenditure was calculated and scaled by gross cash flow as a measure for R&D intensity[2]. This measure was averaged on a yearly basis on industry level using two-digit NACE codes and intra-industry outliers, were removed[3]. The average of the 9 years for each industry was then used as a measure of R&D intensity to proxy for information asymmetries on the industry level. To formally test for the effect of information asymmetries on post-buyout growth, the following regression was performed:

$$Y_{jt} = \alpha_j + \delta_t + post_{jt} + postfirm_{jt} + post_{jt} * R\&D_j + postfirm_{jt} * R\&D_j + \varepsilon_{jt}. \quad (4)$$

Post and postfirm are defined as above, while R&D is the industry-level measure of information asymmetries. In this regression, in addition to the growth measures already introduced above, the logarithm of total tangible assets was included too. The reason for this is that differences in asset composition between high and low R&D firms may affect goodwill recognition at the time of the buyout which would bias the results if goodwill was included in the regression. Since goodwill is an intangible asset, it is excluded when using tangible assets as the dependent variable. The results are shown in table 19.

It is clear from table 19 that for private LBOs, target firms in industries with a high R&D intensity and with higher assumed information asymmetries, post buyout growth is higher in terms of revenue, employees and assets than for firms in industries with lower R&D intensity. The incremental effect is statistically significant at the 1% level for tangible and total assets, at the 5% level for employees and at the 10% level for revenue. For revenue, post-buyout growth is insignificant for industries where the R&D intensity is 0. This is a highly interesting result which is also of very large economic significance. Going from the 25th to the 75th percentile in terms of R&D intensity in the sample of private buyouts and their corresponding control firms increases R&D intensity by approximately 0.25. This means that the incrase in revenue, employees, assets and

[2] Gross cash flow is defined as net income plus depreciation and amortization.
[3] Intra-industry outliers were defined as falling two or more standard deviations above or below the intra-industry yearly mean.

tangible assets relative to peers is 13%, 4%, 11% and 10% higher, respectively, as a result of the buyout.

These results are consistent with the hypothesis that private equity ownership can alleviate credit constraints since such credit constraints, as discussed above, would be expected to be larger in the pre-buyout phase for firms in industries where information asymmetries are higher. If the reason for this incremental effect of including industry level R&D intensity is, as hypothesized, decreased information asymmetries and thus alleviated credit constraints, firms which were ex-ante hypothesized not to be credit constrained should experience no such effect. Table 20 shows the results of running an identical regression for the subsample of public, secondary and divisional LBOs. None of the Postfirm*R&D coefficients are statistically significant which indicates that for non-credit constrained LBOs, the growth in the post-buyout period is not at all affected by

Table 19

Sample of private LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. R&D is an industry level measure of R&D intensity. Other variables are self-explanatory.

Private LBOs

	ln (Revenue)	ln (EBITDA)	ln (Employees)	ln (Assets)	ln (TanAssets)
Postfirm	0.07	0.06	0.16	0.20	0.17
Standard error	0.09	0.16	0.06	0.09	0.09
t	0.78	0.39	2.53	2.24	1.85
p > abs(t)	0.435	0.698	0,012**	0,026**	0,065*
Post	-0.05	0.06	-0.04	-0.06	-0.01
Standard error	0.02	0.07	0.02	0.03	0.05
t	-2.22	0.88	-1.89	-2.16	-0.15
p > abs(t)	0,027**	0.381	0,06*	0,031*	0.882
Postfirm * R&D	0.50	-0.43	0.15	0.43	0.38
Standard error	0.28	0.46	0.07	0.09	0.12
t	1.76	-0.94	1.98	4.67	3.29
p > abs(t)	0,079*	0.350	0,048**	0,000***	0,001***
Post * R&D	-0.07	-0.22	0.01	-0.05	0.00
Standard error	0.04	0.11	0.03	0.04	0.08
t	-1.59	-2.02	0.48	-1.13	-0.03
p > abs(t)	0.113	0,044**	0.634	0.261	0.975
R-square	0.23	0.06	0.16	0.24	0.04
Number of observations	1894	1612	1879	1892	1857

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

information asymmetries on the industry level when using R&D intensity as a proxy. This further supports the hypothesis that private LBOs facilitate growth through easing credit constraints faced by the target firms since there is no other theoretical reason to believe that industry level information asymmetries should have an impact on the difference in post-LBO growth between private targets on one hand, and public, divisional and secondary targets on the other.

Table 20

Sample of public, divisional and secondary LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. R&D is an industry level measure of R&D intensity. Other variables are self-explanatory.

Public, divisional and secondary LBOs

	ln (Revenue)	ln (EBITDA)	ln (Employees)	ln (Assets)	ln (TanAssets)
Postfirm	0.00	0.08	-0.03	0.18	0.12
Standard error	0.07	0.15	0.05	0.09	0.09
t	0.00	0.51	-0.52	2.10	1.29
p > abs(t)	0.997	0.609	0.603	0,037**	0.198
Post	-0.02	-0.18	0.03	-0.05	0.01
Standard error	0.04	0.08	0.02	0.03	0.04
t	-0.57	-2.21	1.26	-1.59	0.18
p > abs(t)	0.566	0.028	0.208	0.113	0.859
Postfirm * R&D	0.01	0.10	-0.03	-0.07	0.04
Standard error	0.06	0.16	0.05	0.08	0.10
t	0.12	0.64	-0.68	-0.89	0.48
p > abs(t)	0.901	0.520	0.495	0.377	0.634
Post * R&D	0.03	-0.03	0.01	0.01	-0.08
Standard error	0.03	0.06	0.02	0.03	0.06
t	0.86	-0.47	0.37	0.46	-1.29
p > abs(t)	0.389	0.641	0.712	0.646	0.199
R-square	0.13	0.04	0.08	0.18	0.03
Number of observations	1546	1279	1503	1542	1515

** Indicates significance at the 5% level

7.3.2 Industry-level financial dependence and post-LBO growth

Rajan and Zingales (1998) show that industries differ in terms of their reliance on external financing. In this case, a natural extension of the hypothesis of credit constraints in private LBOs is that private targets in industries with higher reliance on external financing should grow faster in the post-buyout period than targets in industries with low such reliance (Boucly et al., 2011). Although this argument may be

slightly dubious, which will be discussed in depth above, it was implemented also in this study for the purpose of consistency with Boucly et al. (Ibid.), since this paper to some extent is an out of sample test of the theories of LBO growth developed there.

Therefore, to further test the hypothesis of whether excess growth is likely to come from alleviation of credit constraints, a measure of dependency on external finance was constructed at the industry level, similar to that used by Rajan and Zingales (1998) and later by Boucly et al. (2011).

The measure of dependence on external finance was defined as follows for each individual Swedish firm with over 100 employees and which has the relevant data during at least one year during the sample period:

$$FD_t = \frac{(Total\ assets_t - Total\ assets_{t-1}) - Net\ Income_t + 2 * Depreciation_t}{Total\ assets_t - Total\ assets_{t-1} + Depreciation_t} \quad (5)^4$$

This measure was then calculated for each firm and averaged on a yearly basis on industry level, again using two-digit NACE codes and removing intra-industry outliers defined as in footnote 3. The average of the 9 years for each industry was then used as a measure of dependence on external financing on the industry level, similarly to the procedure for estimating the industry-level R&D intensity measure above.

Using this measure of financial dependence, the following regression was used to formally test the effect of financial dependence on post-LBO growth, where other variables are as previously defined and FD is the newly created industry-level measure of financial dependence.

$$Y_{jt} = \alpha_j + \delta_t + post_{jt} + postfirm_{jt} + post_{jt} * FD_j + postfirm_{jt} * FD_j + \varepsilon_{jt}. \quad (6)$$

[4] Dependency on external finance is measured as the difference between capital expenditure and gross cash flow, scaled by capital expenditure, i.e. a proxy for the percentage of the capital expenditure not financed through the cash flow generated by the firm. Capital expenditure is proxied for as the change in assets plus depreciation, while gross cash flow is calculated as in footnote 2.

Table 21

Sample of private LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. FD is an industry level measure of the proportion of capital expenditures financed externally. Other variables are self-explanatory.

Private LBOs

	ln (Revenue)	ln (EBITDA)	ln (Employees)	ln (Assets)	ln (TanAssets)
Postfirm	0.20	0.26	0.19	0.24	0.14
Standard error	0.11	0.15	0.07	0.11	0.11
t	1.91	1.75	2.61	2.28	1.31
p > abs(t)	0,057*	0,082*	0,009***	0,023**	0.191
Post	-0.13	-0.09	-0.06	-0.12	0.03
Standard error	0.03	0.08	0.03	0.03	0.05
t	-4.40	-1.13	-2.15	-4.07	0.68
p > abs(t)	0.000	0.261	0,032**	0,000***	0.500
Postfirm * FD	0.00	0.07	-0.01	-0.02	-0.04
Standard error	0.03	0.05	0.02	0.03	0.03
t	-0.02	-1.13	-0.26	-0.82	-1.45
p > abs(t)	0.982	0.261	0.796	0.412	0.149
POST * FD	-0.20	-0.03	-0.01	-0.02	0.01
Standard error	0.01	0.02	0.01	0.01	0.02
t	-2.99	-2.15	-1.35	-2.98	0.94
p > abs(t)	0,003***	0,032**	0.179	0,003***	0.348
R-square	0.22	0.06	0.16	0.23	0.04
Number of observations	1934	1639	1914	1933	1898

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

The results are presented in table 21 and table 22 for credit-constrained LBOs and non-credit constrained LBOs respectively, which shows no effect of dependence on external financing on growth in the post-buyout period for either category. For the second category, this result is expected and as hypothesized, although for the former it is not, which contrasts to results presented by Boucly et al. (Ibid.).

This is interesting because it indicates that the reason for the excess growth in the post-buyout period may be something else than alleviated credit constraints. However, there are several reasons why the R&D proxy for information asymmetries may be a more trustworthy proxy regarding the source of excess growth for private LBOs in the post-buyout period. The R&D proxy is intended to directly proxy for credit constraints in the pre-buyout period caused by information asymmetries, whereas the FD variable measures dependence on external financing but does not necessarily provide

information about the actual constraints to such financing prior to the buyout. In other words, a firm's relatively high dependence on external financing does not necessarily mean that its constraints to external financing are high too – as discussed above, constraints to external financing are determined by factors such as information asymmetries, whereas dependence on external financing is a function of the relation between the cash flow generated by a firm and its required investment in productive assets.

In fact, since the measure developed by Rajan and Zingales (1998) measures the percentage of capital expenditure financed externally, it may actually be argued that industries with a high FD measure are less credit constrained than industries with a low FD measure, since in these industries, companies successfully finance a high proportion of their investments externally.

Based on the above, since the intention is to capture the extent to which a firm is likely to have been constrained in its external financing prior to the buyout, the information asymmetry measure could be argued to be an improvement compared to the methodology applied by Boucly et al. (Ibid.). Therefore, although the discrepancy in the results between this paper and that of Boucly et al. (Ibid.) is interesting, the discrepancy should not be seen as conclusive evidence that alleviation of credit constraints are not one of the key value creation mechanisms in private-to-private LBOs. In general, the findings that growth outperformance in the post-buyout periods is concentrated among private targets and that this effect is higher in industries with higher information asymmetries provides strong indications that private equity sponsorship helps mitigating credit constraints previously faced by privately held target companies.

One important mechanism behind the discrepancy in the results may be the absence of actual data on capital expenditures through the Orbis database. Through using the change in fixed assets as a proxy for capital expenditures, any changes in assets resulting from write-ups and goodwill recognition following LBOs and acquisitions are automatically included as capital expenditure. Although these effects should be quite small since the measure is at the industry level, both M&A frequency and goodwill allocation as a percentage of total transaction value differs widely across industries

(KPMG, 2010), which may introduce an industry level bias resulting from method of calculating capital expenditures.

The last potential explanation is, of course, that the excess growth in private-to-private LBOs compared to peers and other buyouts is not caused by lower credit constraints compared to the pre-buyout period. Absent other theoretical explanations for value creation in buyouts, one argument may be that private equity sponsors bring in strategic knowledge and experience which enable target companies to grow faster than in the pre-buyout period, a consequence which would fall under the parenting and mentoring effects discussed above. This is of course possible and quite likely, although it is not sufficient to explain why LBOs which are ex-ante hypothesized to be credit constrained with a relatively high probability would grow faster than LBOs which are ex-ante hypothesized to be credit constrained with a relatively low probability. More importantly, it would not explain why private target in R&D-intensive industries would have higher excess growth than other private targets. If parenting and mentoring effects were the main mechanisms behind the excess growth, this would imply that such effects are even stronger in R&D intensive industries, effectively implying that the advantage of private equity sponsors over original owners and managers in terms of competence and experience would be even higher in such industries. However, this is both unlikely and inconsistent with previous research. For example, it has been argued that firm-specific knowledge is higher in high R&D firms, which leads to a higher proportion of insiders on the board of such firms, and higher Tobin's Q for those firms who do have a higher proportion of insiders (e.g. Coles et al., 2008). This is inconsistent with the idea that private equity sponsors would be able to add even more value in terms of strategic advice in such industries than in industries that are less R&D intensive. Given this, the most theoretically sound interpretation of the fact that private targets in R&D intensive industries tend to grow faster in the post-buyout period than other private targets is that private equity sponsors help mitigating information asymmetries, which facilitates external financing for portfolio companies.

Table 22

Sample of public, divisional and secondary LBO targets and control firms for the period 2003-2012 estimating the impact of underoing a buyout on operating variables. All regressions include firm and year fixed effects and error terms are clustered at the firm level. Post is a dummy equal to 0 for the years preceding the LBO and 1 for the years after the LBO. Postfirm is a dummy equal to 0 in the years preceding the LBO and 1 in the years after the LBO for buyout targets and 0 for all years for control firms. FD is an industry level measure of the proportion of capital expenditures financed externally. Other variables are self-explanatory.

Public, divisional and secondary LBOs

	ln (Revenue)	ln (EBITDA)	ln (Employees)	ln (Assets)	ln (TanAssets)
Postfirm	0.04	0.23	0.00	0.22	0.12
Standard error	0.08	0.15	0.06	0.10	0.10
t	0.50	1.55	0.07	2.32	1.18
p > abs(t)	0.618	0.121	0.943	0,021*	0.241
Post	-0.03	-0.26	0.01	-0.07	0.02
Standard error	0.03	0.01	0.03	0.03	0.05
t	-0.93	-2.99	0.19	-2.47	0.31
p > abs(t)	0.352	0,003***	0.851	0,014**	0.755
Postfirm * FD	0.00	0.06	0.00	0.02	-0.02
Standard error	0.02	0.05	0.02	0.03	0.27
t	0.39	1.19	0.25	0.65	-0.78
p > abs(t)	0.699	0.234	0.799	0.518	0.434
Post * FD	-0.09	-0.04	-0.01	-0.02	0.02
Standard error	0.01	0.02	0.01	0.01	0.02
t	-0.62	-2.38	-0.28	-2.02	1.33
p > abs(t)	0.537	0,018**	0.416	0,044**	0.185
R-square	0.13	0.05	0.09	0.19	0.03
Number of observations	1552	1284	1509	1548	1529

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

8 Conclusions

This paper has studied the operational impact of LBOs on the growth, profitability and efficiency of target firms using a sample of buyouts between 2006 and 2009 in Sweden. The objective of this paper was to answer two specific research questions on operational development in private equity:

a) How does private equity ownership affect the operational development of target companies relative to comparable non-target companies?`

b) How does the impact of private equity ownership differ with respect to pre-buyout ownership, and other characteristics of the buyout.

These two questions were broken down into 6 testable hypotheses. This section will summarize the main findings of the paper as well as reflect on potential implications for the direction of future research on the topic.

Various hypotheses have been put forward as to how and why private equity ownership may be value adding. In general, two such hypotheses have been the most prominent. The first is that private equity ownership can reduce agency costs in an organization and thereby generate value. The second is that private equity ownership brings about certain mentoring and parenting advantages that create value. In general, the first is by far the most accepted and as discussed above, this is probably because most research has been focused on public buyouts in the US, where public corporations with dispersed ownership is the norm.

In addition, as also discussed above, it has been argued that buyouts targeting private companies can help these companies grow through providing access to outside financing.

One of the ideas of this study was to differentiate between these channels of value creation and study their relative importance in different types of buyouts, with a special focus on how their importance differ with respect to pre-buyout ownership. The agency perspective has created a view of the LBO process as one focused primarily on downsizing and redistribution of wealth between various stakeholders and the new owners. A new perspective on this was thought to be especially important since private equity activity has developed a lot in recent years. When private equity first emerged it was focused primarily on large publicly held organizations with dispersed ownership in the United States, which explains why much of the research on the topic has also focused on this type of buyouts. This is no longer the case, especially not in Europe where the large public corporation with dispersed ownership is not necessarily the norm. Since the agency problems faced by different types of organizations with varying ownership structures are very different, the channels of value creation in different types of buyouts are likely to vary too. Part of the goal of this paper was to study such differences. This has not been done extensively, partly because the differences between the different categories of buyouts have not been thoroughly reflected on in research, but also

because data on private companies is very hard to find in most countries. This is especially true for the US, where most research on buyouts has been conducted.

The main idea throughout this paper has been that while public, divisional and to some extent secondary buyouts may be driven by opportunities to create value through reducing agency costs and bringing about parenting and mentoring advantages, private buyouts are most likely driven also by somewhat different considerations. The main suggestion was that private buyouts facilitate growth for target companies through alleviating credit constraints. The sample was therefore split into two categories based on the severity of credit constraints that such targets can be expected to face (based on Boucly et al., 2011). Public, divisional and secondary buyouts were thought of as facing relatively low credit constraints while private companies were thought of as facing relatively high such constraints.

Hypothesis 1 stated that on aggregate, an increase in profitability was expected for target companies following a buyout. This was driven by both the idea that a reduction in agency cost and parenting and mentoring advantages should bring about a positive development in profitability as well as the fact that most previous studies have confirmed this to be the case following a buyout. Hypothesis 2 stated that such an increase in profitability primarily expected to be concentrated in targets not likely to have been credit constrained prior to the buyout, since the motivation behind such buyouts would be more likely to be profitability improvements and/or incentive alignment improvements leading to a reduction in agency costs, rather than growth based on alleviation of credit constraints.

Hypothesis 1 was not supported – in fact, on the aggregate, a reduction in profitability was found on the asset based profitability measures while the sales based profitability measures did not change significantly. Several reasons were discussed as to why this may be the case – one particular problem with the asset-based measures is that assets are written up to market value at the time of the transaction which creates a mechanic decrease in asset-based profitability measures compared to other firms. Another problem is that goodwill is included in total assets, which in this case has the same effect as the asset write-ups. The severity of these two problems is hard to assess, but when

the regressions were performed using only intangible assets in the denominator no decrease in profitability was found, which supports the idea that the decline may have been caused primarily by asset write-ups and not real decreases in operational profitability.

The hypothesis was also tested that private equity sponsored companies had suffered more from the financial crisis than other categories of firms due to their generally higher leverage. No support was found for neither for a linear or a quadratic relationship between target leverage and performance in the post-buyout period.

Hypothesis 2 was considered supported since the group including non-credit constrained firms showed an increase in the sales-based profitability measures (which are the preferred measures given the problems with asset-based measures discussed above), although only the difference in return on sales was significant. For the credit constrained LBOs, all coefficients were either negative or insignificant. In general, even though the evidence lends some support to hypothesis 2, the support is not strong since the development in profitability was weaker than hypothesized overall and only significant for one out of four measures. The general tendency, however, towards more focus on profitability for those buyouts not likely to have been credit constrained prior to the buyout, was relatively clear. In summary, profitability measures were either positive or insignificant for the non credit constrained categories of buyouts, and either negative or insignificant for the credit constrained category of buyouts.

The development in profitability is also closely related to the development in growth. This is especially true given the fact, as discussed earlier, that these two objectives may to some extent be incompatible in the short run. Hypothesis 3 was strongly supported as it was shown that credit constrained LBOs grow significantly faster than the control group in terms of revenues and employees while this is not the case for the other LBO categories. All categories grow faster than the control group in terms of assets, but given the problem of an inflated asset base following the transaction, employees, EBITDA and revenue were seen as the preferred measures. It was also shown that the entire increase in assets for non credit constrained buyouts occur in the same year as the buyout, after which assets start to decline. This strengthens the suspicion that at least part of the

increase in assets is due to transaction accounting. This gives a clear indication that value creation in private LBOs is achieved through growth while this is not the case in public, divisional and secondary buyouts. This, in turn, supports the idea that growth is achieved through alleviating the credit constraints faced by the target prior to the transaction.

To further strengthen the association between growth and alleviation of credit constraints, it was shown that transactions have an even stronger growth effect in industries where information asymmetries (as proxied by an industry-level measure of R&D intensity) are high. Since information asymmetries have been described in previous literature as a source of credit constraints for companies, this is exactly what would be expected if private equity ownership facilitates growth through alleviating credit constraints. In addition, this effect was present only when looking at private targets. Information asymmetries showed no effects on growth for targets that were less likely to have been credit constrained prior to the transaction.

In general, this supports the idea that the value creation mechanisms in general are very different for different types of buyouts, and in particular that one of the key channels through which private buyouts create value is through fuelling growth by increasing access to external financing.

Hypothesis 4 in this paper was that cross-border buyouts would have inferior development in profitability compared to national buyouts due to a higher cost of monitoring and providing strategic advice on an international basis. It was shown above that this sample showed no difference of either economic or statistical significance between developments in profitability between national and cross-border buyouts, which is inconsistent with previous evidence. It was discussed that this may be caused by the fact that international private equity funds that invest in Sweden may be larger and more experienced than smaller Swedish funds. It may also be that there are some scale benefits related to private equity activity and that large international private equity sponsors may benefit from strategic synergies between their portfolio companies that may reduce any costs of owning companies internationally. These effects could unfortunately not be tested for using the sample constructed for this study. Conclusively,

based on this sample, there was no evidence of higher monitoring costs across countries, and hypothesis 4 was therefore not supported.

Furthermore, to test the long discussed hypothesis that private equity gains come mainly at the expense of other stakeholders, primarily employees, wage development for different types of buyouts in the post-buyout period was examined. The general hypothesis has been that since managers for public companies may have an incentive to overpay their employees, private equity owners may generate returns by buying companies and paying employees less. It was shown that this effect existed and was significant at the 1% level – wages in public buyouts tend to decrease in the post-buyout period while the opposite was true for private buyouts. These effects were of high economic significance.

The wage-measure used was total wage expenses divided by number of employees. Clearly, this is not a perfect measure. First of all, employees may be compensated in ways that may not be caught by the total wage expenses post. For example, previous studies have shown a large increase in performance-based pay (e.g. stock options) following a buyout. However, such effects are probably primarily relevant for management and should have little effect on average wages overall.

Secondly, such a measure does not account for changes in composition of skilled and unskilled labor within a firm (e.g. outsourcing following a buyout). In general, however, the tendency is supportive of the hypothesis that some value redistribution occurs between the new owners and other stakeholders. Therefore, hypothesis 5 was considered supported.

It was examined whether companies owned by private equity firms became more or less efficient than their peers in the post-buyout period. In this case, working capital turnover, asset turnover and sales per employee were used as efficiency variables.

Efficiency is closely related to profit and increased efficiency compared to peers can be achieved, for example, by incorporating unique strategic and operational expertise into the corporation. It can also be achieved, however, by reducing agency costs, for example by introducing more performance-related compensation to align employees incentives

with those of the owners. Therefore, both reducing agency costs, and parenting- and mentoring advantages may cause private equity backed companies to be more efficient than their peers. However, the same is true for efficiency as for profit with respect to growth in the short term. As companies invest in fixed and working capital to position themselves for future growth, they may appear less efficient. Therefore, the efficiency effect of private equity ownership was primarily expected for those companies not expected to experience abnormal growth. Hence, the non-credit constrained buyouts were expected to outperform their peers in terms of efficiency.

As hypothesized, the non-credit constrained buyouts showed a significant decrease in working capital levels, which is consistent with increased efficiency. No effect was present for sales per employee and asset turnover showed a significant decrease, which would indicate a decrease in efficiency. Therefore, no general conclusion can be drawn regarding the efficiency impact of buyouts. It should be noted, however, that the working capital measure is the preferred one. This is because, as previously noted, asset-based measures may be affected by asset write-ups and goodwill recognition at the time of the buyout. In general, of course, any measures that are not directly affected by the transaction as such should be preferred. Furthermore, it was shown that when using asset turnover based on tangible assets only, thereby excluding goodwill recognition, the significant negative effect on asset turnover decreased. This may indicate that mechanical increases in intangible assets through goodwill for LBO firms lie behind the decrease in asset turnover. However, as discussed earlier, for some firms intangible assets are a vital part of value- creating assets, and for these firms, excluding intangible assets from the asset turnover calculation may generate a misleading picture. Therefore, such regressions should be regarded only as indicative. In general, it would of course be optimal to exclude goodwill only, or the mechanical increase in goodwill caused by the transaction. Unfortunately, this is not possible with the data available for this study. Conclusively, then, the results regarding efficiency were ambiguous but slightly supportive since asset-based measures are the least-preferred measures in this study. Hypothesis 6 was therefore considered partly supported.

Generally, this thesis has shown that the channels through which private equity transactions create value seems to be highly conditional on pre-buyout ownership. The

evidence in this thesis has provided strong indications that one mechanism through which private equity ownership creates value in private transactions is through alleviation of credit constraints, which is the main differentiating factor of this study compared to most previous literature. As a consequence, the general indication is that private buyouts outperform their peers in terms of growth while other types of buyouts outperform their peers primarily through increasing efficiency and profitability, and in the case of public buyouts, potentially through a redistribution of value between employees and the new owners. All these tendencies are as hypothesized and also confirm the idea that a more thorough examination of the different channels through which various types of private equity transactions create value is needed in future research.

For future research it would be relevant to look at how these effects differs between countries – for example, how does the role of private equity companies as facilitators of external financing differ between countries with more or less developed credit markets? In addition, similar studies from other countries would provide further out-of-sample tests of the credit-constraints hypothesis.

Furthermore, it would be relevant to look more into how the four different categories of buyouts differ. For most of this study, these four groups were aggregated into two groups, credit constrained and not credit constrained. The major reason for this was that these two were the relevant groups for the hypotheses tested in this study. However, disaggregating these groups and looking at the four categories individually would allow for even clearer understanding of how private equity companies add value for different types of buyouts. In this study, some of the categories of buyouts contained a very small number of transactions which made such an approach relatively difficult. Therefore, such an exercise would require looking either at a longer time period, or at a country where the number of transactions is higher.

In addition to differentiating further between the four categories, it would be interesting to differentiate within the four categories. Almost certainly, not all private buyouts are credit constrained prior to the buyout. It seems very likely that at least some of the private buyouts may be, for instance, inefficiently run family firms in mature industries

with relatively low need for external financing due to limited growth opportunities. Such companies may still be bought to take advantage of, for example, mentoring and parenting advantages. To differentiate between these types of private buyouts, one could, for example, look at industry growth rates. Private targets in industries with relatively high growth rates may be more likely to have unexploited growth opportunities than private targets in mature industries. The hypotheses in this thesis were built on the assumption that private companies, in general, have lower access to external financing than, for example, public companies. This is a very reasonable assumption, but not all companies have the same need for external financing. Differentiating buyout on this dimension too, may provide additional insight to how buyouts create value. It would also be a good way to further test the credit constraints hypothesis.

In addition, to further strengthen the indications that private equity ownership alleviates credit constraints for private targets, other measures of financial constraints faced in the pre-buyout period may be studied. These could be measures of leverage or interest coverage ratios, combined with a proxy for profitable investment opportunities at the company level, for example the capital expenditure levels of close competitors.

Finally, to really be able to investigate the effect of private equity ownership in depth, qualitative approaches and case studies may be useful to complement quantitative approaches in future research.

In general, value creation mechanisms in private equity is still a long way from being fully understood. Differentiating the buyouts on pre-buyout characteristics, and understanding that value creation in private equity will differ depending on the situation of the specific target, however, is a good first step. Doing so will provide a clearer picture of how private equity funds create value and generate returns for their investors.

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