STOCKHOLM SCHOOL OF ECONOMICS
MASTER THESIS IN FINANCE 4350

The Predictors of Value Creation in Private Equity Transactions

A study on operational improvements' contribution to gross returns in the private equity industry

Brandon Bartholomew & Pawel Wilczynski

We measure and describe the impact that operational improvements implemented by Private Equity firms' have on the value accretion in their portfolio companies. Our sample is composed of information on twelve deals submitted by five PE firms. We seek to analyze the value generation from enhancing sales, improving margins, reorganizing governance structures, reducing net working capital, and optimizing capital structure. The chosen proxy for value is gross IRR, and our sample includes mostly high IRRs. To ensure uniformity in measurement units between IRR and other ratio variables, we annualize sales and EBITA margin differentials, using the Compound Annual Growth Rate (CAGR) formula. We conclude that sales CAGR, target adjusted sales CAGR, and EBITA margin CAGR have a positive, and significant relationship with IRR. We also find a limited number of occurrences regarding a focus on net working capital and capital expenditures. We cannot however draw a significant conclusion if this is due to a lack of interest in these operational areas or if these areas do not lead to higher IRRs.

We would like to acknowledge the support and guidance we received from Professor Per Strömberg, and the invaluable and insightful input we received from the cooperating funds and their representatives.

Version Date: 6/21/2011

Contents

1 Introduction

There is considerable academic research devoted to the financial, operational and investing aspects that Private Equity (PE) firms attempt to capitalize on in order to produce significant returns on investments. Past research has often focused on the effects that leverage, financial and governance engineering, and capital expenditures can each contribute to a PE firm's success in a transaction. However, there has been limited research examining the operational improvements that a PE firm plans to implement during its holding period. With the increasing maturity of PE industry worldwide, institutional investors now prioritize value creation through operational improvements, rather than through financial engineering and market-timing. In this paper, we attempt to examine the link between operational improvements and the internal rate of return (IRR) among twelve different PE transactions conducted by local Stockholm firms. We then compare the different operational improvements to provide further insight into what leads to a higher IRR.

Over the last two decades the existence of Private Equity firms has risen dramatically. Early on, these firms attempted to create value mainly through financial means: leverage, equity incentives for management and market-timing. With the increased competition however, as well as the greater understanding and sophistication on the investors' part, PE firms must now pay greater focus on creating value through operational improvements and efficiency in order to attract investors. Investors want to invest in a PE firm that creates value through operational improvements to ensure positive returns and reduce exposure to an economic downturn.

This research topic is inspired by several past papers that examine different ways that PE firms seek to improve their acquisition's operations. Although most of their research is focused on debt and management incentives, Baker and Wruck (1989) also discuss some of the ways in which O.M. Scott & Sons Company's operations improved as a result of the tightening of its financial flexibility. Acharya et al (2010) provide an in-depth

analysis of 66 European deals by twelve PE firms in the UK, and find that improvements in the EBITDA-to-Sales ratio and increases in the EBITDA multiple contribute to higher returns. Andersson and Gilstring (2009) examine various operating measurements among 38 companies acquired by PE firms versus a publicly traded peer in Sweden from 1998 to 2008. Their results indicate an improvement during the PE firm's ownership in ROIC, EBITDA margin and net working capital in relation to sales. However, they find that the positive development of performance is related to underperformance prior to the buyout.

Our research strategy is to closely follow the structure of Acharya et al, in which we create a questionnaire for PE firms to fill out concerning some of their recent transactions. Unlike Acharya et al, our focus is mostly Swedish PE firms although some do have a pan-European presence. Instead of focusing mostly on the role of leverage, EBITDA-to-Sales ratios and EBITDA multiples, we intend to focus on the key operational areas that PE firms set out to improve in their value creation strategy. Although not technically an operational measurement, management teams and Board of Directors are paramount in the prioritization and implementation of operational improvements. Due to its significant role in these transactions we will also measure the relationship between leverage and returns. Altogether, we will analyze Sales expansion, EBITA margins, net working capital (NWC), capital expenditures, leverage, and lastly Board and management retention. In looking at these key topics, we also examine how the realized results compare to the PE firm's forecasted results during their due diligence process. By closely examining the targeted result levels, we want to better understand the relationship between achieving pre-determined targets and IRR.

In our study, the returns are given in per annum terms using the IRR. However, our Sales and EBITA margin levels are provided in gross levels over the term of the holding period. In order to compare these measurements on a uniform basis, we convert the sales and EBITA margin growth percentages to a per annum basis using the Capital Annual Growth Rate (CAGR) formula.

In order to measure and analyze our data, we created a Questionnaire (Appendix A) for PE firms to answer that addresses each of our research topics. We contacted thirteen of the leading firms in the Stockholm area and received positive responses from three (23%). In order to increase our sample basis, we also accepted investor reports highlighting and summarizing the main results of exited deals. Although the data in these reports was sufficient to answer the majority of our questions, there were times where we needed to make inferences and conclusions to the best of our abilities based on the data provided. In total, we received data concerning twelve deals from a total of five of the thirteen firms (38%).

Our statistical analysis focuses on quantifying the association between a deal's IRR and a host of other variables. Since we use three different measurement types—ordinal, categorical, and ratio—more than one test is necessary. The two main tests we use are Kendall's Tau test and the Fisher Exact test. Each of these is a nonparametric test, which we use since our sample size is considered small with a size under 30. We are thus uncertain about population distribution. For Kendall's Tau test, we combat this by first converting our test variables into ranks and then sorting them according to IRR. Next, we calculate the Kendall's statistics, based on the subsamples' sizes and the number of concordant and discordant pairs. Finally, using the normal approximation for the Kendall's score statistic we find the associated p-values, providing us the degree of correlation between tested variables. We do this for Sales CAGR, EBITA CAGR and IRR. For leverage and the enhancement of management and the Board, we use the Fisher's Exact Test to measure the strength in relationships between ordinal (high and low pools of the IRR) and categorical variables (presence or absence of examined events). For instance, we investigate whether deals involving Board of Directors enhancement are more likely to result in above average IRR, compared to deals lacking this enhancement. We provide the contingency tables to give the reader a better insight into the distributions observed and expected under condition of independence between IRR and the tested variables.

It is important to note that our sample contains only exited deals with relatively high IRRs, with a range of 26%-242%, and the median at 65%. The year of deal exits ranges from 2004 to 2011. Our research focuses on analyzing and comparing the achievements of PE firms, in order to better understand what fuels their success. Our data consequently experiences selection bias since the majority of our deals examined produce such high returns. Naturally, to achieve this, the idea to include unrealized deals in the sample needed to be abandoned. This has an effect on the distribution in the sample, and might influence a number of test results. Since each of the deals we received was successful, the variance of the value created through the operational improvements is reduced. By examining only IRRs that are mainly on the right side of the distribution curve, many of the operational improvements were realized. If we had access to poorly performing transactions, then we could have a better chance to spot the more risky and/or profitable strategies that impact value creation. Our limited sample size also confined our research with respect to the Fisher Exact test in that we could only perform 2x2 tables. With a greater sample size, these tests could have also provided better insight regarding which operational areas contribute most to value creation.

Sales expansion was a driving force for value creation in the majority of our deals. The key ways in which the PE firms attempted to increase sales were through product expansion, geographical expansion, acquisitions and a shift in business and/or sales strategy. On the expense side, PE firms were mostly focused on improving sourcing and production capacity. Our statistical analysis provided significant results when measuring the relationship between IRR and Sales CAGR (5%), Sales performance against target CAGR (1%) and EBITA CAGR (10%). Leverage and EBITA performance against target CAGR did not produce a significant relationship. Similarly, none of the Fisher's Exact Tests yielded results significant at satisfactory levels.

In order to further build on our research, it would be interesting to see a similar study conducted with a higher number of participating PE firms and overall transactions.

With a larger sample size, one can assume normal distribution and use parametric, non-ranked tests. This would introduce the outlier-related problems, but at the same time it would allow for greater power. In order to further expand the research topic, it would also be interesting to do a follow-up, comparative analysis between firms sold by PE houses to a secondary fund, through an IPO or to an industry peer with synergistic capabilities. Since our results suggest that the PE firms succeed in creating value by improving operational performance, these tests and comparative analysis could seek to examine if the new ownership can continue to build and capitalize on these implemented improvements.

Our primary goal is to provide a link between business performance and the growth in value of the portfolio companies. Specifically, we will look at both the tangible and intangible actions that PE firms attempt to perform. It is our intent to gain a greater understanding of the predictors that lead to higher IRR for PE firms. The novel approach of our study is that we do not draw a comparison between private equity targets and their public counterparts. Instead, we compare the IRRs achieved by PE firms on deal exits, and attempt to define the essence that sets apart the more and less successful investments.

Our paper is laid out in the following manner. After the Introduction, we present a brief overview of the rise of the private equity industry. We then review the literature published on the subject of value creation by PE firms. The content mostly addresses our primary fields of interest, namely corporate governance, margin improvement and cash management. It is our belief, however, that the alternative factors that might positively contribute to IRRs should be mentioned as well. A short examination of current research efforts on the ability of PE partnerships to use extensive leverage, efficient capital structure, and market timing is also provided. In the following chapter we lay out our hypotheses. To achieve greater specificity, we further subdivide each of the abovementioned six areas, as well as the ranking of strategic importance concerning these areas. Once the theoretical background and our expectations towards results are covered, we move on to describe our research methods, and then present the aggregated results of

our study. We provide both a quantitative and qualitative analysis of the results from our sample. The paper is concluded with a short discussion of the accuracy of our hypotheses, as well as suggestions for follow-up research.

2 Development of Private Equity

Private equity[1] is a relatively modern industry, with its roots from the turn of the 20th century in the United States. The first large private equity buyout was the acquisition of Carnegie Steel Co. by J.P. Morgan in 1901. It was not until 1955, however, that the first leveraged buyout occurred, when McLean Industries Inc. purchased Pan-Atlantic Steamship Company and Waterman Steamship Corporations. Holding companies began to be used as investment vehicles in the 1960s, and the first specialized funds emerged in the late 1970s. Leveraged buyout transactions, or private equity deals, with substantial external debt financing (50-70% of transaction price) did not become a common transaction until the 1980s. The next two decades were characterized by a regular boom-bust cycle. It was not until the early 2000s, however, that LBOs[2] gained foothold in Europe, and the first major inroads in the Asian market happened even more recently.

It seems peculiar that the first large private equity transaction occurred 110 years ago, but that sixty-three years had to pass before the organizational structure specifically designed for such ventures was employed to generate returns. Furthermore, nearly two more decades had to pass for the LBOs to become a significant element of the corporate and capital market scene in the U.S., and two more decades for the same phenomenon to achieve a strong position in Europe[3] (Almond 2002). However, in the last several years private equity in Europe has grown and developed considerably. Sweden is a remarkable illustration of this trend. In 2009 private equity investments reached 0.432% of GDP,

[1] Throughout this text, whenever mentioning 'private equity' (PE) we have in mind financial sponsors acquiring majority shareholding in target companies. Early stage ventures (venture capital and, to some extent, growth capital) are excluded from the scope of our analysis.
[2] From this point forward the term 'leveraged buyout' will be used interchangeably with 'private equity transaction' and 'buyout'.
[3] In 2001 European LBOs value ($44 bn) exceeded the US counterpart ($10.7 bn) for the first time.

which ranked third in the world behind the U.S. and the U.K. (EVCA 2011). Swedish PE firms own enterprises employing 850,000 people worldwide, of which 180,000 of these employees work in Sweden and comprise 7% of the private sector workforce. Turnover of these companies equals SEK 736 billion globally, with SEK 250 billion in Sweden. The latter number is equivalent to 8% of national GDP (SVCA 2011).

Even though the numbers mentioned above seem impressive, the relative investment rate has been much better in the past. Swedish PE investments totaled 0.87% of GDP in 2001 (Bohman and Baumgarten 2003). The large fall is a consequence of the recent financial crisis, credit crunch and investors' flight to low-risk investments – in 2009 European PE funds raised €16.1 billion, while in the two previous years the figure had been over €80 billion each year. There is a consensus among practitioners that to maintain and expand investor commitment, PE firms will need to focus on operating improvements, reducing agency costs and providing networking services to the target companies, rather than on benefits associated with financial engineering and leverage. Additionally, in the near to mid future, a large share of funds can be expected to be routed to secondary buyout firms, infrastructure projects, natural resources and opportunities in Asia (Fairless, 2010). The other trend that might challenge the current outlook of the industry is the pressure on general partners to forego some of their benefits. Institutional investors have formed an Institutional Limited Partners Association (ILPA) and are actively seeking to reduce management fees, minimize the penalties for limited partners' commitment withdrawals and reach a compromise in the matter of deal and consulting fees that portfolio companies are charged with by their PE owners (economist.com 2010).

3 Literature Review

Since becoming a popular investment area in the 1980s, considerable research has been conducted on the private equity sector. Researchers have examined both the positives and negatives that are associated with this industry, and its overall impact on the

companies acquired for both the short-term and long-term. We next provide a short summary of the key research that has examined the different ways in which PE firms attempt to maximize their returns. We first focus on operational improvements: reducing net working capital, improving EBITA margins, sales expansion and capital expenditures. We then examine how financial engineering, such as leverage and market timing, and improvements in corporate governance play a role in the value creation process.

3.1 Working Capital

One of the key abilities of the successful PE firms is identifying excessive assets and costs, and then either replacing them with more efficient solutions or eliminating them altogether. In practice this implies working capital reduction, optimization of value-added processes, and shutting down non-value added investments and activities. It should be kept in mind however, that the business process optimization is not strange to the firms not backed by PE professionals either. This trend reduces the restructuring component of value in the LBOs, and negatively affects the attractiveness for a number of potential acquisitions (Wright, Wilson and Robbie 1996).

A recent research on French LBOs carried out between 1999 and 2004 suggests that the share of working capital in total capital employed after the PE firm takes control falls by 1% (Boucly, Sraer and Thesmar 2009). The phenomenon of working capital reduction is further discussed in the review of research on value generation in buyouts. According to the highlighted studies, PE funds are known for professionalizing and tightening accounts receivable and inventory management (Berg and Gottschalg 2005). The case study carried out in a large U.S. lawn care equipment manufacturer pointed to the same two sources of improvement (Baker and Wruck 1989). On top of inventory reduction and receivables collection acceleration, the PE-backed management typically negotiates more favorable vendor credit terms.

3.2 Margin Improvement

Besides pressuring the portfolio companies to scale down their employed capital, PE firms actively set out to tighten corporate spending and enact cost reduction programs (Berg and Gottschalg 2005). Acharya, Hahn, and Conor (2010) find a 2 percentage point increase in EBITDA-to-Sales margin, compared to the sector averages, for the respective PE-backed firms. These authors further find that an improvement in operating margins is a major source in value creation in the deals that do not involve subsequent M&A activity. From an earlier time period, Bull (1989) uses a group of 25 LBOs in the U.S. in order to examine why PE-backed firms enjoy higher margins than their competitors. The author suggests that the operating margins of the sampled firms were more resilient to market conditions, and did not erode together with the margins of competitors in the analyzed period. There are ongoing discussions as to whether investment by a PE firm does in fact lead to a company achieving operating margins higher than those of the benchmark group. A study on 192 deals over $100M, completed during the 1990 – 2006 period, suggests that margin improvements in this group are only slightly larger than for the comparables (Guo, Hotchkiss and Weihong 2009). At the same time, the post-LBO firms bear larger risk, due to increased leverage and a reduced asset base.

3.3 Sales Expansion

The usual PE targets enjoy stable revenues and cash flows, so that the acquisition debt can be serviced without additional external financing (Smith 1990). Very often, the 'stable level' means below the industry average and manufacturing companies with relatively low productivity—translating to below average sales levels—are more prone to being taken over (Lichtenberg and Donald 1989). According to the authors, LBOs are followed by abnormal productivity growth. The view that PE-induced leveraged buyouts lead to above average revenue growth is maintained in a recently conducted research, and backed with two arguments (Loos 2005). First, entry of the PE fund causes equity redistribution and a revival of entrepreneurship through increased management ownership stake. Second, PE firms are able to time the markets, thus allowing them to enter when the industry growth

prospects are high and exit before they deteriorate. An interesting study on privately held LBO targets suggests that PE-led buyouts enjoy larger sales growth than the industry average, and that non-PE led buyouts suffer from weaker sales growth (Chung 2010). Although most sources point out that portfolio companies' sales benefit from PE-led guidance, there is also another perspective to the issue. In Acharya, Hahn, and Conor's (2010) study of PE transactions during the 1996-2004 period in the UK, the authors find that the deals with highest *alpha*, the nonsystematic component of return, have sales growing in line with overall industry, and the extra value is captured through margin improvements.

3.4 Capital & Research and Development Investments

There has been a widespread discussion regarding the commitment to building sustainable value for target companies by private equity funds. According to the opponents of risk capital, PE firms prioritize the realization of quick gains from both the beneficial tax treatment of leverage and the diversion of operating cash flow to equity holders, over the development of sustainable strategies. As such, one might conclude that a PE sponsored LBO leads to a reduction in the budget for Research and Development (R&D), the freezing of capital expenditure and a halt on innovation. Firms that undergo a LBO are thus ultimately hurt in economic terms. The research suggests otherwise, however.

An early paper on LBO's effects on a firm's productivity and related aspects, using deal samples in the US from 1978-1986, shows that investments in R&D is one of the key contributing factors to improving the business (Lichtenberg and Donald 1989). According to the researchers, firms with the lowest productivity measures were most likely to be bought out, and subsequently noted abnormally high productivity improvements. At the same time their research efforts were intensified; the R&D-to-sales ratio rose by 50% and the number of scientists and engineers in the workforce increased by 21% in the 9-year period. However, other research carried out almost simultaneously to Lichtenberg's and

Donald's suggests that there is no significant difference between the intensity of R&D activities at firms that underwent a takeover compared to those that did not (Hall 1988).

A more recent study of 70 U.S. private equity buyouts valued at greater than $250M, during the 2002-2005 time period, shows that LBOs do not hinder investment effort. On the contrary, LBOs might actually accelerate spending in this area (Shapiro and Nam 2009). Capital spending for 53 of the portfolio companies, for which data was available, rises by 14.6% annually during the period of interest, compared to 3.5% annual capital spending growth in the overall economy. On a similar note, the intensity of capital expenditures (CAPEX / Sales ratio) at PE-backed companies exceeds the economy average at a rate of 7.9% versus 5.3% three years after the takeover. To further emphasize the role that PE firms have on increasing capital expenditures, the ratio for these companies was a meager 4.4% before the surveyed firms were acquired.

When analyzing the investment propensity of portfolio companies, there are important factors to consider besides just the monetary value invested. The results and success of the investments is also important. A recent study analyzing the effects of private equity finance on patent applications and grants in 18 European countries, during the 1991–2004 period, provides some evidence that PE firms indeed bolster innovation (Popov and Peter 2008). It has been suggested by these authors that, while PE financing forms only 8% of aggregate PE and industrial R&D spending, PE-led firms account for 18% of industrial innovation. The study examined the entire value-based private equity sector, including venture capital. Given that VC is only a minor fraction of all PE, we believe that this result conveys significant insights for our research.

To conclude the review of research on the long-term investment propensity of PE-led firms, we look at the recent investigation of the quality of patent policies adopted at those firms. The study examines a sample of 495 firms backed by PE funds during the 1986-2005 period (Lerner, Sørensen and Strömberg 2008). No significant evidence that the PE induced LBO affects the overall number of patent applications has been found.

Despite these results, the authors discover that the patenting activity becomes more focused on the areas in which the target company has been historically successful. A measure of the patent quality, i.e. the number of citations in the first three years after patent award, shows a 25% increase for PE portfolio companies.

3.5 Leverage & Financial Engineering

Another way in which PE firms improve operational efficiency is through the increased debt levels from the buyout-induced capital structure. With increased debt levels, management teams must be more cognizant of the firm's spending in order to ensure that they can make the required interest and principal payments (Kaplan and Strömberg, 2008). Jensen (1986) argues that these increased debt levels limit the free cash problems that management teams can encounter in which they choose to spend money on poor projects and investments, rather than returning it to shareholders. The new debt levels instead force management teams to re-evaluate their businesses, and lead to business divestments, rather than investments. By selling non-profitable divisions, management can focus its abilities on its productive divisions as well as receive funds to help reduce the debt level (Easterwood et al, 1989). Smith (1990) found a correlation between increases in operating cash flows (before interest charges) with buyout-induced changes in debt ratio. PE firms' use of high debt to finance its acquisitions forces management teams to more efficiently allocate its funds to its investments, leading to increased operating cash flows and firm value.

While significant research shows that debt-induced PE acquisitions leads to better operational efficiency, these added debt levels do not benefit all of the firm's claimholders. Warga and Welch (1993) find that existing bondholders suffer losses in LBOs, with higher-rated and longer-term bonds experiencing on average greater losses. The main effect of these losses comes around the time of the LBO announcement. The wealth loss of the original bondholders is argued to be a direct result of the increase in default risk caused by the incremental LBO debt financing (Smith, 1990). With excessive

debt levels and required periodic interest payments, firms increase their probability of financial distress when the targeted operating cash flows are not reached, to the detriment of their pre-existing debtholders (Axelson et al, 2010).

PE firms are also able to improve the financial performance and generate positive returns in their holding companies thanks to their in-depth understanding of the capital markets. In some cases, PE firms use their financial engineering skills and even take on some of a CFO's duties such as negotiating bank loans, bond underwritings, initial public offerings, and subsequent stock sales (Anders, 2000). Anders highlights that in KKR's famous ownership of RJR Nabisco, KKR saved at least $50 million in a bond repurchase program due to the KKR's timing and pricing decisions. PE firms have a competitive advantage in debt capital markets due to their consistent activity within the market and thus their need for reputational goodwill. Cotter and Peck (2001) argue that it is important for PE firms to retain their reputation as "good" borrowers to insure their access to debt capital on relatively favorable terms since they will continuously return to these markets. These authors also find that PE firms tend to finance their deals with more subordinated and long-term debt in order to minimize interest payments and thus the chances of default. Jensen (1986) argues that it is the structure or terms of the debt that has the most impact on a manager's motivation and incentives.

3.6 Governance Engineering

Another key factor that benefits PE firms in their quest to enhance value in the acquired companies is the small dispersion of shareholders that they work with. Most large, publicly traded companies suffer due to its dispersed group of shareholders. As a result, it is hard to properly monitor management so shareholders must rely on the board to fulfill this role and properly align benefits to the positions of management (Cornelli and Karakas, 2008). It is the responsibility of the Board of Directors to align rewards and performance, but directors are reluctant to reward CEOs with substantial financial gains for superior performance or impose meaningful financial penalties for poor performance (Jensen and

Murphy, 1990). These authors state that the long-term effect of this risk-averse orientation is an erosion of the relation between pay and performance, which leads to entrenched, bureaucratic compensation systems. Analyzing 250 large companies, they find that the median CEO receives a $2.59 increase in wealth for every $1,000 change in corporate performance.

Another way in which PE firms are able to improve corporate governance is through the combination of equity and the salary structure that it offers management. By providing significant equity stakes to management teams, research shows that executives are better incentivized to reach successful results. Jensen and Murphy (1990) argue that there are three ways to align the compensation of an executive in order to maximize company value: 1) Boards can require that CEOs become substantial owners of company stock, 2) salaries, bonuses, and stock options can be structured so as to provide big rewards for superior performance and big penalties for poor performance, and 3) the threat of dismissal for poor performance can be made real. By implementing proper benefits for their performance, as well as both monetary and professional costs for underperformance, PE firms are able to better ensure that a management team is motivated to put forth the necessary effort in order to reach the expected results. While 9 out of 10 CEOs in Jensen and Murphy's study owned less than 1% of the company's shares, PE firms offer higher equity stakes as a means to improve operational efficiency and performance.

3.7 Stock-Picking Ability

There is a significant amount of research devoted to analyzing if it is a PE firm's ability to purchase undervalued companies that contribute largely to their excess returns, rather than the operational and efficiency improvements they implement. Holderness and Shaun (1985) analyze this topic and find that PE firms are more adept at finding market inefficiencies. This in turn leads to greater positive returns in their deals. While market efficiency theory implies that all relevant information is publicly available, PE firms receive

assistance in finding undervalued firms through their network of contacts. Achleitner et al (2011) argue that management teams for public companies look for potential outside investors if they believe their stock is underpriced. In this sense, PE firms use their broad contact network to extract private information in order to better analyze their targets' prospects (Kroker, Rapp & Wolff, 2010). These authors also believe that one of the key drivers of success within private equity is its human capital. Most employees at PE firms have senior-level experience from investment banks, consulting and law firms. They argue that this experience allows PE firms to more intelligently analyze public information and thus find undervalued companies.

4 Hypotheses

Our primary set of hypotheses concerns the relationship between two drivers of economic value, Sales and EBITA margins, and the IRR. When PE firms choose to invest in a company, it is typically due to a sales growth potential in the company's products or inefficient operational performance. Through the implementation of a business plan intended to capitalize on one or both of these issues, the PE firm can capture significant returns. We thus propose that both expanding sales and increasing margins will lead to a stronger IRR. Due to an insufficient amount of quantifiable data on working capital management, we cannot test its association with IRR.

PE firms have a very thorough understanding of how they believe they can improve a company's operational performance due to the research and due diligence it performs on the company. Through its due diligence process and analysis of the company and market, the PE firms have a sufficient understanding of the timeline that is adequately needed to carry out its operational improvements. We thus believe that the company's that succeed in meeting their timeline targets will enjoy greater results and a higher IRR.

While setting targets for portfolio companies is an excellent way to guiding management towards its desired results and forecasting future value, it might discourage

further improvement once these targets are met. Similarly, if the target is too ambitious, it might also discourage agents from exercising value maximizing effort since they are unlikely to avoid the punishment for missing the assigned goals. We thus want to test to see if there is a relationship between the IRR and the degree to which operational targets are met or not met.

Private equity firms derive significant benefits, both implicitly and explicitly, from their increased leverage ratios due to the high amounts of borrowing they use to finance their transactions. As Jensen (1986) and Kaplan and Strömberg (2008) both show, management teams under PE ownership must keep a close eye on their spending, with a clear focus on trying to eliminate wasteful spending in order to meet its new debt obligations. As a result, management teams must carefully analyze their investment opportunities and cost allocations in order to maximize their spending and ensure that goals and timeframes are met. We thus expect to see a positive correlation between leverage ratio and both operational performance and IRR.

By providing ownership and salary structures more heavily based on performance, PE firms can better ensure that their business plans are carried out effectively. During the due diligence process, PE firms are able to carefully analyze and scrutinize the strengths and weaknesses of the current management team. They then choose to retain or replace management based on their analysis of management's ability. Thanks to the wide network of industrial professionals and excellent advisory contacts, PE firms are in good position to spot weaknesses and deficiencies in both the management team and Board of Directors of the target companies. We thus believe that a change in management will lead to a higher IRR.

Our research is not only interested in measuring the relationship between the actions of the PE firms and the deals' IRRs, but also in the agendas and plans for the target companies and the associated results. We have compiled a set of six major goals that have

the potential to form a complete strategy in most of the PE buyouts and gauged the perceived relative importance of each of them. These are sales expansion, EBITA margin improvement, capital investments, WC management, management retention, and management incentives. Unfortunately, due to an insufficient amount of data collected on the last two categories, we are not able to test whether they can be successfully used as predictors of magnitude of IRR. We believe that each of these strategic opportunities, if correctly spotted and adequately followed up, can lead to a greater IRR. We propose therefore that a focus in one specific operational area will not increase the probability of an increased IRR, compared to focusing on a different opportunity. Instead, it is the ability of the PE firm to make the improvements and capitalize on the opportunities that they find that will lead to greater IRR.

5 Methodology

The main purpose of testing in our paper is to quantify the association between a deal's IRRs and a host of other variables. Due to the fact that we have employed three different measurement types—ordinal, categorical, and ratio—more than one test is necessary. Additionally, our sample size is less than 30 and thus considered small. We therefore cannot be sure about the population distribution and need to conduct nonparametric tests as a result. Table 1 shows the scale and tests associated with each hypothesis.

The first step we take, once we formulate our hypotheses, is to decide whether the collected data will require any re-scaling. We then must choose the most appropriate testing tool that will enable us to maintain statistical rigor and generate easily interpretable results. To best meet these goals we use Kendall's Tau test and Fisher's Exact Test.

Table 1: List of Hypotheses and the Statistical Tests used for each Hypothesis

No.	Hypothesis *IRR is positively correlated with:	X-axis Data Type (Y-axis Data Type)	Testing Method
1a	Sales CAGR	Ratio (Ratio)	Kendall tau-a
1b	EBITA margin CAGR	Ratio (Ratio)	Kendall tau-a
2a	Achievement of sales expansion targets	Categorical (Ordinal)	Fisher exact test
2b	Achievement of EBITA margin improvement margins	Categorical (Ordinal)	Fisher exact test
3a	Degree to which sales targets are exceeded	Ratio (Ratio)	Kendall tau-a
3b	Degree to which EBITA margins are improved	Ratio (Ratio)	Kendall tau-a
4	Leverage ratio	Ordinal (Ratio)	Kendall tau-b
5a	Mgmt team enhancement	Categorical (Ordinal)	Fisher exact test
5b	BoD enhancement	Categorical (Ordinal)	Fisher exact test
6	No individual strategic focus is better than any other one, with respect to the probability of scoring in the top half of the IRR	Ordinal (Ordinal)	Fisher exact test
	*does not apply to Hypothesis 6		

5.1 Kendall's Tau tests

The first method, used to test the different hypothesis in Hypotheses 1, 2, and 6, is based on the Kendall's Tau-a and Kendall's Tau-b tests. Kendall's Tau-a, developed by Maurice Kendall in 1938, is one of the most widespread non-parametric tests for correlation, with high power and more direct interpretation than another widely used test, Spearman's Rank Correlation. Kendall's Tau-b is a variant of the original Tau-a test, proper for testing association between variables with tied values. The first requirement of Kendall's Tau tests is that the measurements of both tested variables are converted into ranks, and then sorted according to either one (Table F.1 in Appendix F).

For hypothesis 1a these variables are IRR and Sales CAGR and for hypothesis 1b the variables are IRR and EBITA margin CAGR. The same logic applies to Hypotheses 2 and each hypothesis in Hypothesis 6. The list of rank-adjusted results can be found in Appendix C. The second step is to count the number of concordant and discordant pairs, where pairs are defined as (X_n, Y_n), with *X* and *Y* symbolizing the measurements of analyzed variables recorded for the n^{th} deal. Two pairs (X_p, Y_p) and (X_r, Y_r) are considered concordant if the subtractions $X_p - X_r$ and $Y_p - Y_r$ yield values of an equal sign. If the opposite is true, the pair is declared discordant. If either $X_p - X_r$, or $Y_p - Y_r$ is equal to 0, the pair is considered tied, and not counted as either concordant or discordant.

Tau-a is calculated as:

$$\tau = \frac{n_c - n_d}{{}^1\!/_2 \times n \times (n-1)}$$

In Tau-a there is no adjustment for ties. For Hypothesis 2, where tied pairs occur, the Tau-b is used:

$$\tau = \frac{n_c - n_d}{\sqrt{\left[\frac{n(n-1)}{2} - t_x\right] \times \left[\frac{n(n-1)}{2} - t_y\right]}}$$

Where:
n_c= number of concordant pairs
n_d = number of discordant pairs
n = sample size
t_x = number of ties for X variable pairs
t_y = number of ties for Y variable pairs

The results are interpreted as follows. For Kendall's Tau-a, the ratio of probabilities of observing concordant pairs compared to discordant pairs equals $\frac{p_c}{p_d} = \frac{1+\tau}{1-\tau}$. For example, if τ is found to be equal to 0.5, the above mentioned probability $\frac{p_c}{p_d}$ provides a value of *3*, so it is three times more likely to find concordant pairs to discordant pairs (positive correlation). Tau can range from *-1* to *+1*, with *0* signaling independence of variables. For both Tau-a and Tau-b, the chosen significance level α is set at *10%*. The associated Kendall's score has approximately normal distribution, thus we expect it to be over twice as large as the standard error for the findings to be recognized as significant.

5.2 Fisher's Exact Test

The hypotheses in Hypotheses 3, 4b, and 5 require a completely different approach. Since these relationships involve binomial and categorical (for Hypothesis 3) variables, a contingency table combined with Fisher's Exact Test (FET) is employed. To build the contingency tables, first the size and then the column and row categories have to be decided. In all 7 instances, tables are in the 2x2 format, so the standard Fisher test can be used. The upper horizontal (row) category contains the total of deals that are pooled together based on their higher IRR, while the lower one contains those that constitute the lower half of IRR (instead of "above average IRR"). The vertical categories are created individually for each hypothesis. All matrices can be found in Appendix D. The null hypothesis for FET is that both variables are uncorrelated and the distribution across

columns is not affected by chosen row categories. The statistic is calculated by first totaling outcomes for each row and column. The second step is to calculate the total number of tables with different outcome distributions, and the same column and row subtotals. Finally, the probability *p* for each of the matching tables is calculated, by using the formula:

$$p = \frac{(r_1! \cdot r_2!) \times (c_1! \cdot c_2!)}{(x_{11}! \cdot x_{12}! \cdot x_{21}! \cdot x_{22}! \times N!)}$$

Where:
r_n = subtotal of row n outcomes
c_n = subtotal of column n outcomes
x_{ab} = number of outcomes in a cell from row a, column b
N = table grand total

Finally, the partial probabilities are summed up. If the total probability *P* is less than 0.10, the null hypothesis of independence is rejected at the 10% level.

6 Data Collection

In order to measure and analyze our data, we created a Questionnaire (Appendix A) for PE firms to fill in that addresses each of our research topics. We contacted thirteen of the leading firms in the Stockholm area and received positive responses from three (23%). In order to increase our sample basis, we also accepted investor reports highlighting and summarizing the main results of exited deals. We thus received assistance from a total of five of the thirteen firms (38%) and received information regarding twelve deals.

Although the investor reports differed from the survey, we were still able to extract most of the valuable information that we were interested in analyzing. These reports typically had the following characteristics: 1) why the PE firm was originally interested in the company, 2) the business plan and strategic objectives the PE firm planned to pursue, 3) the success the PE firm had throughout the holding period in carrying out its plan and objectives, and 4) the exit strategy and how the deal was closed. In our analysis of this

data, we made inferences and conclusions to the best of our abilities based on the data provided. Most of this concerns the issue of strategic importance that the firms had regarding the different operational areas for each deal. While we received numerical data for many of these areas concerning targets, strategic importance is a more subjective measurement in our survey. We thus evaluated this matter based on the PE firms' comments regarding investment reasons and business plans in their investor reports.

Our research focuses on the relationship between IRR and sales, EBITA margins, leverage, management retention, and strategic goals upon entering a deal. Our sample contains exited deals between 2004 and 2011, and includes mostly deals with a relatively high IRR (minimum at 26%, median at 65% and maximum at 242%). It is our intent to analyze and compare the achievements of PE firms, and see what fuels their success. Naturally, to achieve this, we only use high yield deals. This skews the distribution in the sample to the right, and likely influences a number of test results. Due to the success rate of our transaction sample, the variance of the operational improvements and value creation in our data does not adequately reflect the variance we expect to find in the industry as a whole. The fact that all analyzed transactions were successful implies an unnaturally low number of missed targets and may not sufficiently consider the risks associated with PE investments. Not knowing the full extent of these risks makes it difficult to determine which strategy has the largest expected return.

7 Results

We start the section by presenting the overview of the descriptive statistics. The two tables included show the means, medians and ranges for processed data, and IRRs associated with identified areas of operating improvements. Histograms concerning IRR, sales, EBITA margins, leverage and targets can be found in Appendix B. Next, we discuss our results by the order of topics, rather than the order of hypothesis, in order to allow for continuity in our results and corresponding qualitative analysis. We will thus present our findings related directly to Sales, EBITA margins, leverage, Corporate Governance, NWC

and Investments. Lastly, we will discuss the impact of the significance of strategic importance that PE firms place on these different operational improvements has on the IRR.

7.1 Descriptive Statistics

As we mentioned earlier, the sample is composed of twelve deals with mostly high IRRs. The sample has a median equal to 65%, a mean of 81%, and the range in the sample totals 216%. We did not receive a full sample concerning our test variables since every deal did not include strategic emphasis in each of these areas. Table 2 below shows the range, median and means for the annual growth rates of each of our test variables, as well as the leverage ratio. Table 3 then provides these same descriptive statistics concerning the IRR for the operational improvements that were commonly identified by the PE firms. Since each target company was acquired with several goals on the agenda, the case counts within the main strategic categories (e.g. sales expansion) do not add up to the number of cases in the entire sample. Within a certain area (e.g. sales), some companies had multiple plans for generating value and are thus included in each area they focused on.

Table 2: Descriptive Statistics for our test variables

	Cases	Range	Median	Mean
IRR	12	216.0%	65.0%	81.0%
Sales CAGR	11	54.6%	9.4%	17.0%
Sales CAGR Targets	8	35.7%	9.9%	10.3%
EBITA Margin CAGR	9	5.4%	1.3%	1.9%
EBITA Margin CAGR Targets	6	1.6%	0.7%	0.7%
Leverage	11	74.8%	55.0%	48.2%

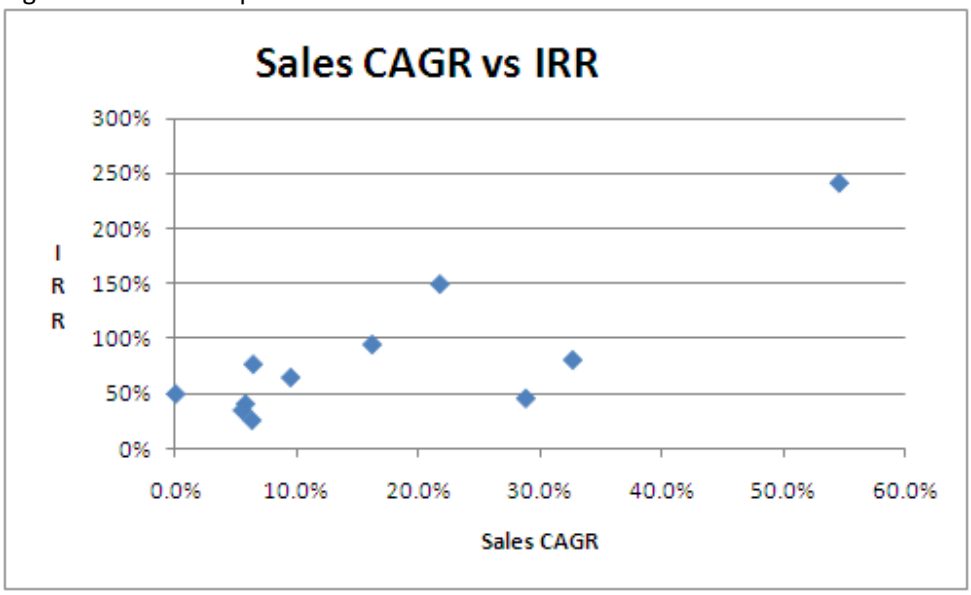
Table 3: Descriptive Statistics for frequently occurring operational activities

OPERATIONAL IMPROVEMENT	Cases	IRR		
Sales		Range	Median	Mean
Product Expansion	7	216%	65%	93%
Geographical Expansion	5	192%	77%	103%
Business focus shift	5	69%	65%	63%
Acquisitions	5	207%	95%	117%
EBITA Margins				
Cost Management	5	124%	64%	72%
Sourcing	5	216%	65%	93%
Production Capacity	4	60%	56%	60%
NWC Management	6	69%	55%	55%
Increase in Investments	4	207%	56%	97%
Decrease in Investments	2	9%	46%	46%
Board Enhancement	7	207%	77%	88%
No Board Enhancement	2	14%	57%	57%
Management Enhancement	8	69%	48%	56%
No Management Enhancement	2	178%	153%	153%
Overall	12	216%	65%	81%

7.2 Sales CAGR

From our sample data, eleven of the cases provide us with data concerning sales improvements. In order to compare IRR and the sales levels on a uniform basis, we annualize the overall sales performance during the PE firms holding period using the compound annual growth rate (CAGR) formula. The range for the sales levels, using CAGR, is 0% to 55% with a median of 9.4%. Figure 1 shows the relationship in our data between Sales CAGR and IRR. As this graph shows, there appears to be a positive correlation between consistent sales growth and IRR.

Figure 1: Relationship between Sales CAGR and IRR



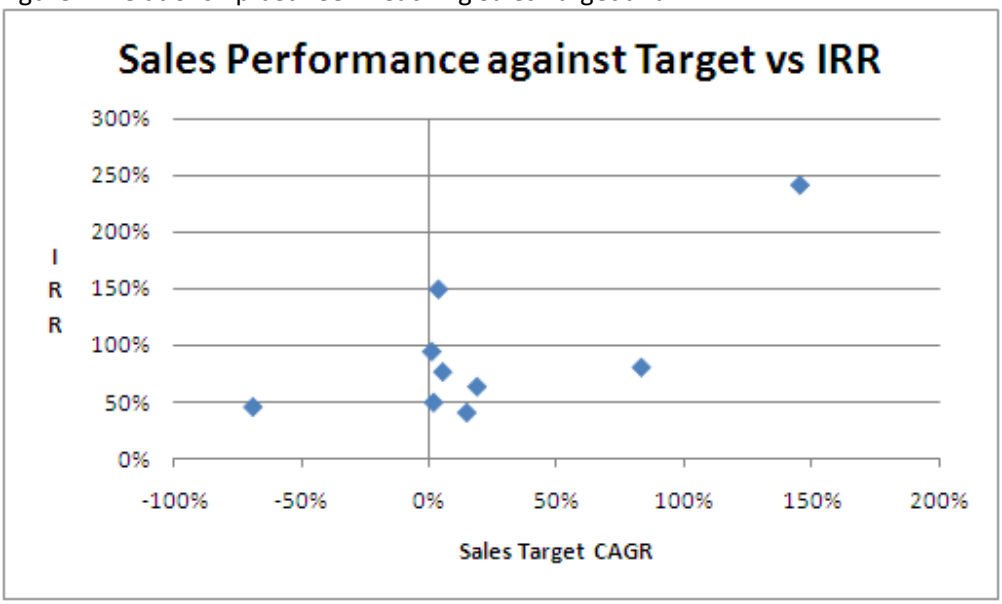
Aside from these descriptive statistics, we employ Kendall's Tau-a test to further analyze the relationship between Sales CAGR and IRR in Hypothesis 1a. The Kendall's score for this analysis is 29, with a standard error of 12.845. These results suggest that there is indeed a strong correlation between these two variables. With the two-sided p-value of 0.0293, we are confident that Sales CAGR is a strong predictor of deal IRR. The Kendall's Tau-a, which slightly exceeds 0.5, shows that the ratio of concordant to discordant pairs in the sample is larger than 3:1. This means that it is three times more likely to find positive correlation between these two factors than it would be to find negative correlation. These findings are reported in Table C.1, in Appendix C.

Besides the annualized growth rate, we also want to see if there is a connection between a PE firm achieving its forecasted sales targets and the subsequent IRR. There are nine cases where we have the necessary data to measure this; with seven examples of success and two of failure. Both examples of failure led to the bottom half IRR outcome, while only two out of seven (28.6%) instances of meeting the target ended with the same result. Table D.1 shows however that the result of the Fisher's Exact Test, with two-sided p-value of 0.167, does not allow us to infer any conclusion at the adopted significance

level. Due to the low number of observations, the adopted definition of high and low IRR pools and uneven distribution of the results, the FET offers very little power. The calculated p-value, although not significant in strict statistical terms, gives a strong indication that the relationship between achieving the sales CAGR target and IRR may not be completely independent.

Other than simply meeting sales targets, we also examine if the extent to which the targets are exceeded will affect the IRR. The range of annualized target adjusted sales growth from this data is -7% to 44%. Table C.1 shows that Kendall's score is stronger here than in the case of regular Sales CAGR, at 26, with a standard error of 9.592. Likewise the Kendall's Tau-a is equal to 0.722, and the two sided p-value shows significance of below 1%, at 0.009. We believe this is a strong argument in favor of the hypothesis that the level in which the sales CAGR target is exceeded strongly impacts the PE firm's IRR.

Figure 2: Relationship between Reaching Sales Target and IRR



In each case from our sample, sales expansion was a driving force for value creation. There was however differentiation in the cases in how sales growth would be achieved. The key ways in which the PE firms attempted to increase sales were through product

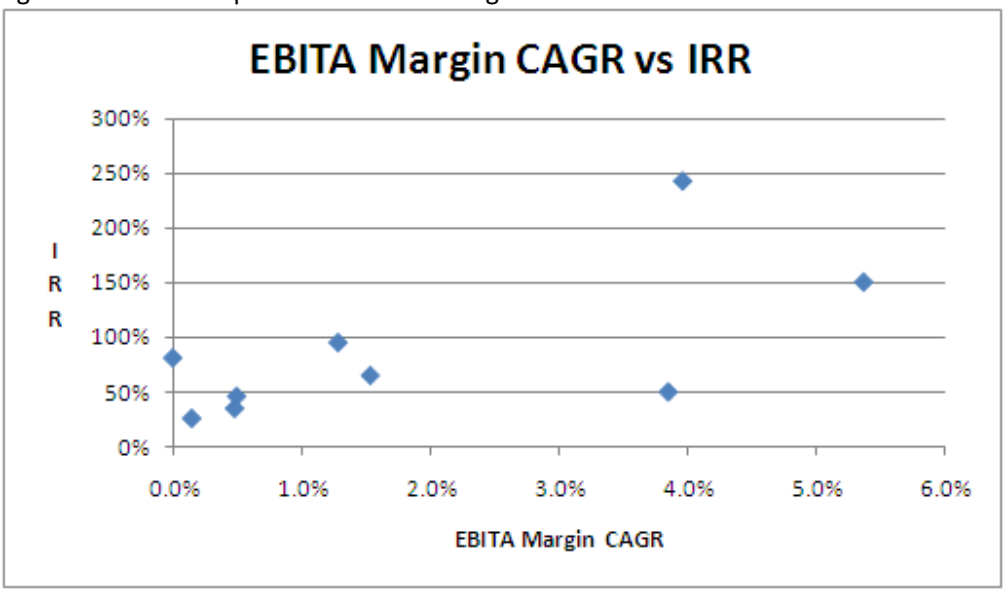
expansion, geographical expansion, acquisitions and a shift in business and/or sales strategy. The most prevalent strategy, product expansion, occurred in seven of our twelve cases. In these instances, the focus tended to be on enhancing the product portfolio and then capitalizing on these new products with a significant increase in sales. The demand for these products was often times strong due to shifts in technology and patent creations. Geographical expansion, both in Sweden and/or Europe, was a strategy for sales growth in five cases. This strategy contributes to value creation not only through the transparent increase in sales, but through exposure to a larger market and customer base. As a result, the PE firms benefit from the company's added attractiveness to potential buyers due to the increased customer and market exposure. This in turn leads to an increase in the number of bidders and drives up the value when the PE firm wants to sell.

Aside from product and geographical expansion, PE firms sought to improve sales and increase the value of its companies through acquisitions. This occurred in five cases, and were done largely in order to eliminate competition, increase the customer base, and/or to cross-sell products. A shift in the business and sales strategy also occurred in five cases. The rationale for these shifts was mainly to take advantage of the changing landscape in a market and/or to focus on sales that had higher gross margins. Sales were also improved through pricing analysis, which was aimed at improving expectations between pricing and product performance.

7.3 EBITA Margin CAGR

Based on the collected data, we have nine cases to analyze EBITA margin improvement. We analyze the relationship between this variable and the IRR by annualizing the EBITA margin, using the CAGR formula for the same reasons as discussed in the sales section. The range for the EBITA margin levels, using CAGR, is 0% to 5.4% with a median of 3.8%. Figure 3 shows the relationship in our data between EBITA margin CAGR and IRR.

Figure 3: Relationship between EBITA Margin and IRR

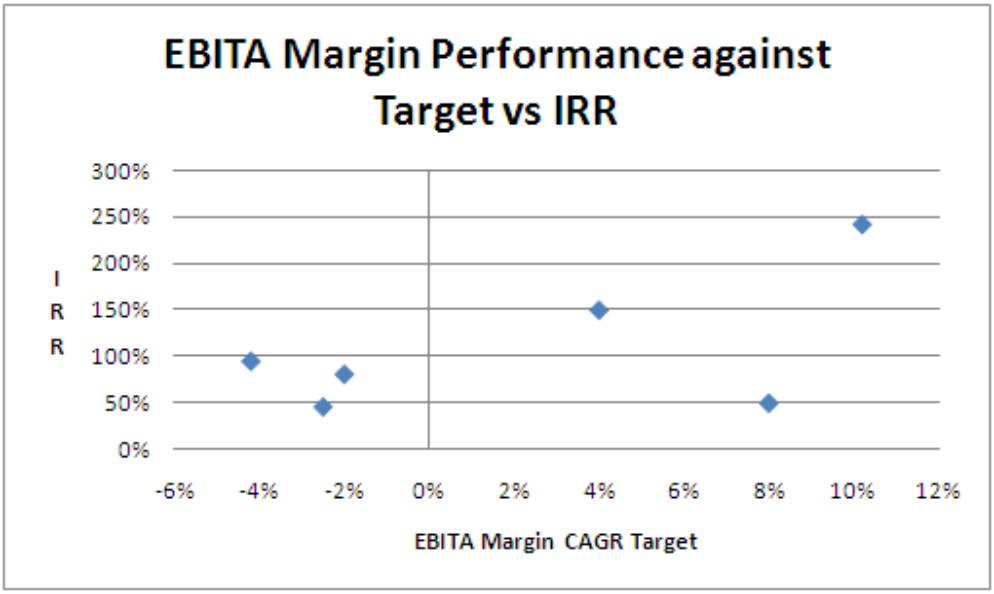


As with the Sales analysis, we employ Kendall's Tau-a test to further analyze the relationship between EBITA margin CAGR and IRR. The Kendall's score for this analysis is 18, with a standard error of 9.592, which are found in Table C.1 in Appendix C. Given these results, and the two-sided p-value of 0.0763, we infer the correlation between IRR and EBITA margin CAGR is significant at the chosen 10% significance level. Under an assumption that increasing the EBITA margin CAGR is highly unlikely to lead to a decrease in IRR, we test the hypothesis using the 1-sided test. This test yields a significant positive relationship with a 0.0382 p-value. Finally, Kendall's Tau-a of 0.5 shows a three to one probability of randomly drawing a concordant to discordant pair in the sample.

To see whether meeting the EBITA margin CAGR target can be used as a predictor for realized IRR, we use Fisher's Exact Test. Based on our sample of six deals, the two sided p-value is 1.0 (Table D.2), showing an absolute lack of dependence between the two variables in the data. The recorded distribution is even between the performers and non-performers, with two deals for each scoring in the top half IRR bracket, and one deal for each in the bottom half of the IRR bracket.

Seeing a much higher Fisher's Exact Test statistic than in the case of sales, we do not expect to find significant association between IRR and EBITA margin CAGR performance, relative to set targets. The calculated Kendall's Tau-a statistic of 9, together with the standard error of 5.323 suggest that this is the case (Table C.1). The two sided p-value of 0.1329 does not allow for positive conclusion at even the 10% significance level. We see however a mild relationship between the discussed variables, using one sided testing. The analyzed six deal sample ranged from -0.6% to 5.4%, with median at 1.3%, as exhibited in Figure 4 below.

Figure 4: Relationship between Reaching EBITA Margin target and IRR



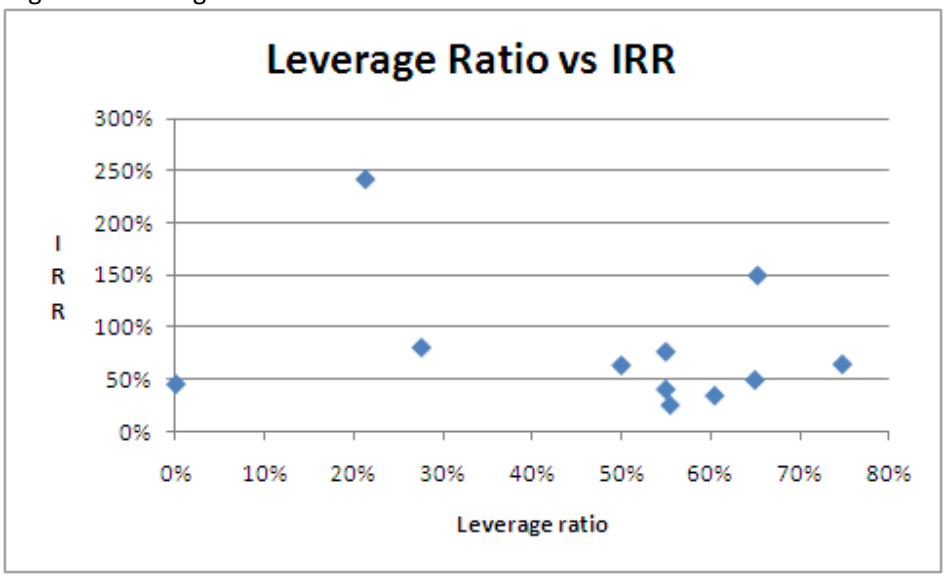
As already mentioned, nine companies (75%) cited improvements in operating margins, through improvements and greater efficiency in the company's production and operations, as a key rationale for their investment. The main methods for improving operating margins were cost reduction/operational efficiency, production capacity, and sourcing. Of these cases, seven included a focus on cost reduction and operational efficiency as a key to making these improvements. The PE firms reduced costs largely by examining its capacity costs, re-location of key production facilities and improving the centralization and logistics of the operations. These improvements led to better

production and thus a reduction in costs of goods sold and higher gross margins. In a similar manner, production capacity also contributed to improved operating margins and was cited in four examples. In these instances the PE firms focused largely on improving the effectiveness of its assets through better product specifications and machine automation.

7.4 Leverage

We have eleven responses relevant for testing the correlation between leverage and IRR. Since four answers are provided using a range of 10%, we must first discretize this data set in order to match the seven remaining figures where we have the leverage ratio. In order to measure this data using Kendall's Tau test, we then proceed with ranking the outcomes. This procedure yields one tied variable pair, and we therefore need to implement a modification to Kendall's Tau test. We use the Kendall's Tau-b test, also discussed in the methodology. The resulting Kendall's Tau-b value is found to be -0.1468, while the two-sided p-value equals 0.5846 (Table C.1). This result suggests that there is no significant relationship between leverage and deal IRR in our sample, which is consistent with the findings of Axelson et al (2010). Our sample of leverage ratios ranges from 0% to 75%, with the median at 55%. The discretized data is displayed in Figure 5 below.

Figure 5: Leverage Ratio and IRR



7.5 Corporate Governance

There is a high level of management retention in our sample data, with only two cases in which management is not retained when the PE firm took over ownership. However, most of the remaining cases involve the PE firms making expansive changes to the management team. There are nine cases for which we have enough information to infer whether changes were made to the Board of Directors (BoD), and ten cases regarding the changes in the management team. The Fisher's Exact Test we run on these two samples suggests that there is little relationship between enhancement or replacement of either one of the groups and the corresponding deal IRR. One reason for this is the near uniformity in changes taking place across the whole sample. In case of the management team, enhancement is performed eight times out of ten, while BoD is modified seven times out of nine. The second reason is that observed distribution is close to expected one, under an independence assumption. The resulting Fisher's Exact Test statistic is equal to 1.0 for management and 0.44 for BoD (Table D.2). However, given the low power of the test, and small sample size, we find it reasonable to propose that BoD enhancement might indeed be mildly correlated with following IRR, and deserves further investigation.

Changes or enhancements to the management team are often made in order to allow the PE firms to better execute their operational goals, for example in implementing growth strategy or providing more international experience. One reason that management retention is so high, and contrary to our hypothesis, stems from the interest the PE firms have in these companies *due to* the management team in place. In several instances, the strength and focus of the existing management team is indicated as a key rationale for investing in the company.

One reason for the high level of management retention appears to be the operational goals of the PE firms. The main goal in these instances is an increase in sales, via portfolio or geographical expansion. As such, the current management team may possess superior knowledge with respect to both the current and future product lines. The

PE firms could then add to the management team with individuals that have more experience in international expansion and/or experience in the new markets the companies are targeting. While operational improvements are often cited as performance measurements, sales growth seems to be the main focus in these transactions. This could suggest the rationale behind the high management retention in our sample; whereas if operational improvements and costs reduction are the key focus then the management retention would likely be lower as these measurements imply weak management.

7.6 Net Working Capital and Capital Expenditures

Improving the Net Working Capital (NWC) is another key operational focus for the PE firms in our sample. However, due to a lack of quantitative data on this topic we are not able to provide statistical analysis of NWC's effects on IRR. In seven deals, improving the NWC situation—specifically the NWC/Sales ratio—is listed as an important factor. The main takeaway we deduct from this information is that improving the NWC would improve cash management abilities and provide a better ability to pay off the interest from leverage. For several of the companies, the focus of the PE firms in improving the NWC/Sales ratio is in order to bring it in line with its industrial peers.

Similar to the data on NWC, we could not perform sufficient statistical analysis on the effects that capital expenditures play on IRR in PE transactions. In our sample, capital expenditures were only listed as an operational performance measurement in six cases. This might suggest that capital expenditures are rarely the top priority for the PE houses, or that the deals that focus on capital expenditures might not lead to the high IRRs that the majority of our sample generates. Of these, two examples aimed at *reducing* the capital expenditures while four focused on increasing investments in order to capitalize on the potential benefits of increased production or long-term investment benefits. Although sound conclusions cannot be made due to the small sample size and a lack of information on the actual amounts of the implemented capital expenditure changes, our limited data

appears to confirm prior research's findings that PE firms do not contribute to the necessary capital expenditures that a long-term investor would make.

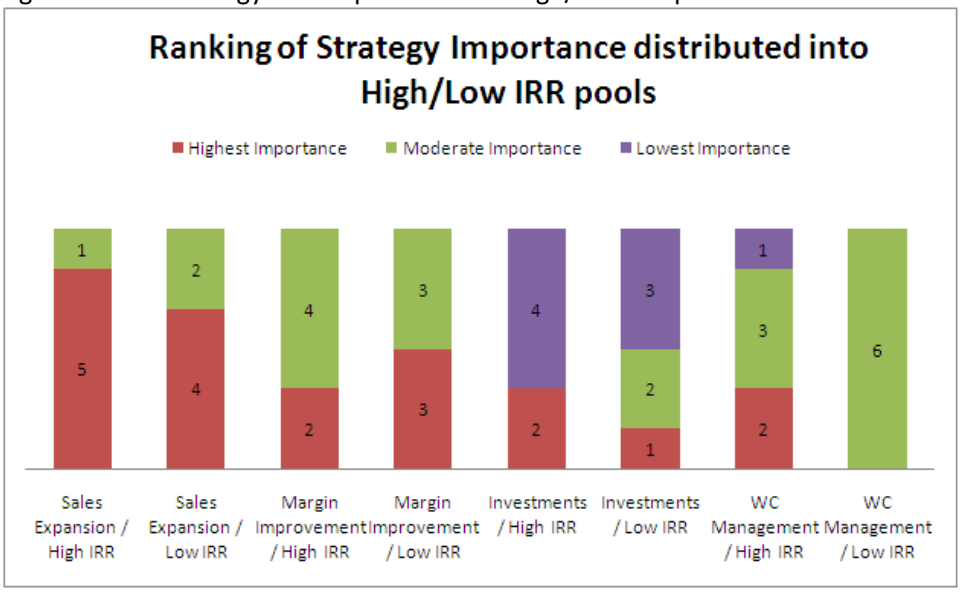
7.7 Strategic Importance

In order to perform statistical analysis on the strategic importance, we first ask our questionnaire respondents to rank the order of importance for sales growth, cost reductions, management retention, NWC and investments (Appendix A, question 6). In order to match this data properly with our interpretations of the data we have from the Investor Reports, we re-classify the rankings using a 1-3 order of importance, where 1 is little or no importance and 3 is most important. In certain cases, a 3 is applied to more than one improvement area when it appears both factors are ranked equally high by the PE firm. The results from these rankings are provided in Table E.1. Our goal through this analysis is to see if a focus on one operational aspect will lead to greater returns, compared to focusing on another operational area.

We carry out twelve Fisher's Exact Tests, measuring each operational area against one another, to see whether one can expect different IRR outcomes as a result of focusing on different strategic areas. We first distribute the deals into two groups based on the top and bottom half of IRR. We then perform tests to measure if the IRR is significantly higher when Category A (i.e. Sales) receives more importance than Category B (i.e. Investments). Our results are provided in Appendix D, but unfortunately do not provide any significant findings. We believe this implies that there is not a specific improvement area that a PE firm should target and seek to capitalize. Rather, it is the firm's ability to find weaknesses and/or opportunities in a company, and the ability to put together a strategy that can generate significant returns in order to create additional value in the company. Figure 6 enclosed below shows the distribution of importance scores with reference to strategic goals and the IRR buckets. The IRR buckets for each area always sum up to twelve cases, and both the top and bottom one contains six entries. A closer look at the data distribution shows that sales growth is the priority goal for most deals (75%), compared to

42% deals focusing on margin improvement, 25% on expansion of investment capital and only 17% on optimization of WC. Additionally, we see that while sales and margins are never considered a tertiary issue, in more than half of all deals (58%) the leading management teams do not view capital expenditures as a source of significant value creation. Given that some cases, in which *Investments* area is considered important, contain plans to decrease level of spending, we believe there is some evidence that, at least in the analyzed sample, expanding PPE or R&D is not a key for a high IRR.

Figure 6: How Strategy affects placement in High/Low IRR pools



8 Conclusion

Our research focused on analyzing deal information from local PE firms in the Stockholm area in order to measure the relationship that operational targets and achievements have on the IRR. We obtained data regarding twelve deals during the 2000s from a total of five firms, which represents 38% of the firms we contacted. Our main focus areas were Sales, EBITA margins, Leverage, Corporate Governance, Net Working Capital (NWC), Investments, and finally the ranking of strategic importance for each of these areas. For Sales (11 results), EBITA margins (9), Leverage (11), and Corporate Governance (10 on

management and 9 on Board of Directors), we analyzed these relationships in a variety of ways to see how they impact IRR. Due to insufficient data for NWC and Investments, we could not perform the proper statistical analysis to measure their impacts on IRR.

To make the most use of our sample, including categorical, ordinal and ratio data, we decided to employ the Kendall's Tau and Fisher's Exact Tests. Both of these propose the null hypothesis that the two tested variables are independent, while the former is applicable to rank converted ordinal and ratio results, and the latter to categorical results. With the Kendall's Tau test we were able to discover a statistically significant positive relationship between sales CAGR and deal IRR, based on both one and two sided p-values. Additionally, we found a link, significant at the 5% one-sided level, that EBITA margin CAGR is also positively correlated with the IRR. We expected to see such an association in both of these cases since both IRR and CAGR are annualized figures. Our further rationale for this belief was based on the fact that increased sales and higher margins, ceteris paribus, should translate to higher cash flow available to investors.

The second round of tests using Kendall's Tau tests involved the analysis of sales and EBITA margin CAGR performance relative to the established targets. We found that outperformance of sales CAGR targets is indeed a strong predictor of the subsequent IRR. On the other hand, research on the EBITA margin CAGR relative performance uncovered the link only at the 10%, one-sided, significance level. A possible explanation of this fact is that our sample size for this test was reduced to only six cases. This was caused by the low number of collected responses on the actual EBITA margin targets. The last Kendall's test concerned association between leverage used in deals, and the following IRR upon exit. The test statistic turned out to be negative, but it is not statistically binding. This result suggests that the extent of debt financing does not automatically translate to higher returns. In certain cases, however, high leverage might still be favorable for investors. A further study in this area, with control variables established, might be able to unveil a relationship between these two variables.

The Fisher's Exact Test did not allow us to draw any statistically significant conclusions in any of the areas we explored. The main reason for that situation is the uneven distribution in the sample. This is clearly visible when analyzing the relationship between Management Team and Board of Directors PE-enforced enhancement, and the IRR. The majority of cases involved the studied event (70% for the Management Team and 78% for Board of Directors), and these formed the bulk of both the bottom and top halves of the IRR categorized sample. The same issue affected the result of our test measuring if the sales CAGR target will lead to the deal scoring in the top half of IRR. The Fisher's Exact Statistic was relatively close to significance (at 0.167), but the fact that the sales target was achieved in 78% of the cases radically reduced the power of the test. Interestingly, no relationship between reaching the EBITA margin target and achieving the top/bottom IRR was found, even though the results were evenly distributed. This however can be attributed to the small sample size (six cases), ambitious goals and the predominant sales focus in the deals. Finally, we employed the Fisher's Exact Test to examine if a focus on one particular element of strategic development—sales, margins, investments or working capital management—would lead to better results than focusing on the other elements. After testing all pairs against each other, we came to a conclusion that no single focus dominates the others, and that it is definitely worthwhile to seek all existing opportunities in these business areas.

8.1 Further Research

In order to further expand on our research, one area of improvement would be to involve a greater sample base. To achieve that, we suggest centering the paper on the core information produced systematically by PE firms in their investment reports. That way the strain and time requirements on the cooperating entities are greatly reduced, while the bulk of data is still collected. In order to collect sufficient data regarding each of the main areas, it might be necessary to request this data in the different deals, i.e. ask for deals where WC management and Investments are key issues, rather than obtaining a sample comprised mostly of sales expansion. This way, there will be a broader range of data in

order to better analyze the impact that the different operational targets have on value creation.

A larger sample base will also allow for higher statistical power. Firstly, one could perform more robust and in-depth statistical analysis to measure correlation and dependence between varying operational measurements and IRR. Secondly, our small sample size includes a heavy emphasis on sales in order to create additional value, whereas other operational improvements do not occur as frequently. With a larger, more diverse sample size, additional research can further expand our topic in order to draw better conclusions concerning which operational areas create the most value for PE firms.

Additionally, with the rising market of secondary buyouts, it would also be interesting to examine how the results differ between: 1) the primary buyout fund vs. the secondary buyout fund, and 2) deals when the company is sold by the primary fund a) via IPO, b) to an industry peer, or c) to a secondary buyout fund. In the latter, the research can examine if a company's operational and financial performance drops in the case of IPO and/or industry sale compared to a secondary buyout firm. This analysis could help to confirm or refute the theory that PE firms improve business efficiency. Finally, we believe that such an investigation could examine whether the improvements carried out by the PE firms persist after an exit.

Bibliography

Acharya, V. V., Hahn, M., & Conor, K. (2010). *Corporate Governance and Value Creation: Evidence from Private Equity.*

Achleitner, A.-K., Andres, C., Betzer, A., & Weir, C. (2011). Wealth effects of private equity investments on the German stock market. *The European Journal of Finance*, 217-239.

Anders, G. (1992). The "Barbarians" in the Boardroom. *Harvard Business Review*, 79-87.

Baker, G. P., & Wruck, K. H. (1989). Organizational Changes and Value Creation in Leveraged Buyouts. *Journal of Financial Economics 25*, 163-190.

Berg, A., & Gottschalg, O. (2005). Understanding Value Generation in Buyouts.

Bohman, S., & Baumgarten, F. v. (2003, June 4). *Sweden's private equity industry*. Retrieved March 14, 2011, from http://www.altassets.com/private-equity-knowledge-bank/country-focus/article/nz2633.html

Boucly, Q., Sraer, D., & Thesmar, D. (2009). *Leveraged Buyouts – Evidence from French deals.* World Economic Forum USA Inc.

Bull, I. (1989). Financial Performance of Leveraged Buyouts: An Empirical Analysis. *Journal of Business Venturing 4*, 263-279.

Chung, J.-W. (2010, January 14). Leveraged Buyouts of Private Companies. Ohio State University.

Cornelli, F., & Karakas, O. (2008). Private Equity and Corporate Governance: Do LBOs Have More Effective Boards? *Working paper, London Business School*, 1-36.

Cotter, J. F., & Peck, S. W. (2001). The structure of debt and active equity investors: The case of the buyout specialist. *Journal of Financial Economics*, 101-147.

Easterwood, J. C., Seth, A., & Singer, R. F. (1989). The Impact of Leveraged Buyouts on Strategic Direction. *California Management Review*, 30-43.

economist.com. (2010, May 6). *Private inequity*. Retrieved March 14, 2011, from economist.com: http://rss.economist.com/node/16064057

EVCA. (2003). *deutsche-beteiligung.de*. Retrieved March 14, 2011, from http://www.deutsche-beteiligung.de/files/publikationen//studien/0503_evca_familybusinessprivateequity_en_b245281e67.pdf

EVCA. (2011). *Private equity funds raised*. Retrieved March 14, 2011, from http://www.evca.eu/uploadedFiles/Home/Knowledge_Center/EVCA_Research/Statistics/4_2_Fundraising/YB10_Annual_funds_raised_by_European_private_equity.pdf

Fairless, T. (2010, August 9). *Private equity emerging from the deep.* Retrieved March 14, 2011, from http://www.efinancialnews.com: http://www.efinancialnews.com/story/2010-08-09/private-equity-emerging-from-the-deep

Guo, S., Hotchkiss, E. S., & Weihong, S. (2009). Do Buyouts (Still) Create Value? *Journal of Finance*, (forthcoming).

Hall, B. (1988). The effect of takeover activity on corporate research and development. In A. J. Auerbach, *Corporate Takeovers: Causes and Consequences* (pp. 69-100). Chicago: University of Chicago Press.

Holdernerss, C. G., & Sheehan, D. P. (1985). Raiders or saviors? The evidence on six controversial investors. *Journal of Financial Economics*, 555-579.

Jensen, M. (1986). Agency Costs of Free Cash Flow, Corporate Finance and Takeovers. *American Economic Review*, 323-329.

Jensen, M. C., & Murphy, K. J. (1990). CEO Incentives--It's Not How Much You Pay, But How. *Harvard Business Review*, 138-153.

Kaplan, S. N., & Strömber, P. (2008). Leveraged Buyouts and Private Equity. *NBER Working Paper Series*, 1-41.

Kroker, M., Rapp, M. S., & Wolff, M. (2010). Are Private Equity Investors Governance Champions or Simply Stock Picking Specialists? *Working Paper*.

Lerner, J., Sørensen, M., & Strömberg, P. (2008, December). Private Equity and Long-Run Investment: The Case. Harvard Business School.

Lichtenberg, F. R., & Donald, S. (1989). The effects of leveraged buyouts on productivity and related aspects of firm behavior. *CES*, 89-5.

Loos, N. (2005, April 19). Value Creation in Leveraged Buyouts. St. Gallen.

Neuberger Berman. (2010). *2010 Private Equity Outlook.*

Popov, A., & Peter, R. (2008). Does Private Equity Investment Spur Innovation? Evidence from Europe. *JEL*.

Shapiro, R. J., & Nam, P. D. (2009). *The Impact of Private Equity Acquisitions and Operations On Capital Spending, Sales, Productivity, and Employment.* SONECON.

Smith, A. (1990, April). The Effects of Leveraged Buyouts.

SVCA. (2011). *Venture capital in figures*. Retrieved March 14, 2011, from http://www.svca.se/sv/Om-riskkapital/Riskkapital-i-siffror/&prev=_t&rurl=translate.google.com&twu=1&usg=ALkJrhiCUn5CEyh5dx4E8HT0Lx6JwL_-fA

Warga, A., & Welch, I. (1993). Bondholder Losses in Leveraged Buyouts. *The Review of Financial Studies*, 959-982.

Wright, M., Wilson, N., & Robbie, K. (1996). The Longer Term Effects of Management-led Buy-outs. *Journal of Entrepreneurial & Small Business Finance 5(3)*, 213.

Appendix A – The Survey

1) Please answer the following questions regarding the basics of the deal:
   a. Entry Date Time Range

      1999-2000 2001-2002

      2003-2007 2008-2009

   b. Exit Date Time Range

      1999-2000 2001-2002

      2003-2007 2008-2009

   c. Please choose the appropriate Industry from below:

Raw materials	Manufacturing
Services	Knowledge-based

      i. How many prior deals had the firm been involved within this industry? _____

      ii. If no prior deals, was there an employee or employees with experience from this industry?
      NO YES If yes, how many employees? _____

      iii. If no experience at all, was an Advisory Board used:
      No YES If yes, how many people were on the Advisory Board? _____

   d. Please list the leverage ratio of debt that was used to finance this deal:

50% or lower	51-60%	61-70%
71-80%	81-90%	91-100%

   e. What was the IRR that this company yielded during the holding period for your firm?

2) How many months did your firm have this company as a potential target before due diligence began?

3) How many months did the due diligence process take?

4) Approximately how many hours were spent working with on this deal and how many investment professionals were involved at the following stages:

	Pre-deal	**First 3 months**	**3-12 months**	**12+ months**
How many hours were spent per employee and per week?				
How many investment professionals were involved at each stage?				

5) In the following questions, we want to analyze how Private Equity firms attempt to improve the various aspects of their holding company's operational improvements.

Please fill in the tables below with data on the operational and strategic targets for management. In the second column specify whether management was instructed to pay attention to carry out improvements in the areas listed in the first column. In the third column, fill in the targeted change from when the business plan was initially approved by your fund, in each relevant area. In the fourth column, fill in the actual change realized, as measured at the exit date. In the fifth and sixth column, type in when was the improvement planned to be realized, and when it actually materialized. The unit used throughout the table is **percentage points**.

Cost and Expense Management

Improvement Initiative	Relevant for Management	Operating Level at Entry Date	Targeted Improvement	Outcome at exit	Scheduled Timeframe	Actual Timeframe
Gross Margin - example	YES		3 percentage points	3 p.p.	2 months	4 months
Gross Margin						
Marketing & distribution spending						
Personnel Costs / Sales						
Number of Employees / Sales						
Overhead expenses						

Investments

Improvement Initiative	Relevant for Management	Operating Level at Entry Date	Targeted Improvement	Outcome at exit	Scheduled Timeframe	Actual Timeframe
R&D expenses						
Capital Spending						
IT Infrastructure						

Working Capital Management

Improvement Initiative	Relevant for Management	Operating Level at Entry Date	Targeted Improvement	Outcome at exit	Scheduled Timeframe	Actual Timeframe
Cash / Sales						
Inventory / Sales						
Accounts receivable / Sales						
Accounts payable / Sales						

Sales and Growth Expansion

If Growth Potential played a factor, how did your firm act on this? In the second column please state whether the management planned to pursue actions listed in column one. The unit for the third and fourth column is sales increase in **percentage points**.

Category	Relevant for Management	Targeted Result	Outcome at exit	Scheduled Timeframe	Actual Timeframe
Sales					
Product expansion					
Geographical expansion					
New distribution channels					
Number of customers					

Product expansion = products not offered before takeover; product improvements and upgrades do not apply

Management Retention

Were the following key personnel replaced, either at acquisition or during ownership due to lack of performance? If these leaders were replaced during ownership, please also list the timeframe for when this occurred.

Position	At Acquisition	During Ownership (Number of Months)
Board of Directors		
Chairman		
CEO		
CFO		
Sales & Marketing Director		
COO/Operating Director		

Management Incentives

How far down the line of management was an equity stake offered?

Position	Equity Stake	Number of Persons applicable
Boards of Directors		
CEO		
Functional Directors		
Middle Management		
Others		

What percentage of equity was awarded to management, including equity options?

Stake levels	As a Percentage of Common Stock Equity, excluding options	As a Percentage of Common Stock Equity, including options
0-5%		
6-10%		
11-15%		
16%+		

How was the aggregate structure of management's renumeration affected in comparison to pre-buyout?

a. Increased Base Salary
b. Increased Bonus
c. Disregarding equity stakes, what percentage of the base salary comprised the overall salary compensation (disregard benefits)?

Pre-buyout: _____ Year 2: _____
Year 1: _____ Year 3+: _____

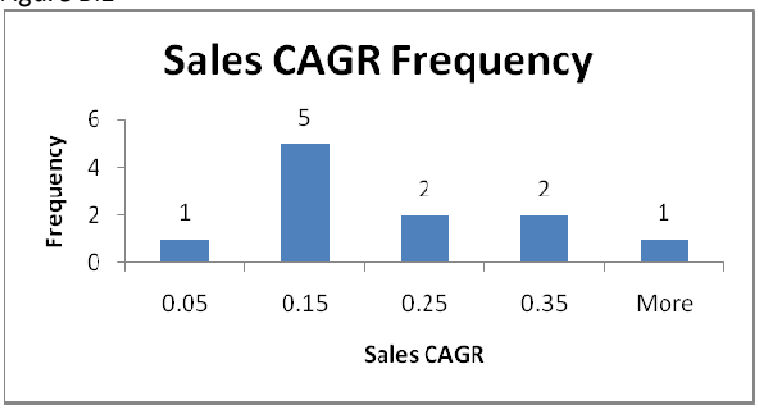
6) Please list the amount of importance that your firm placed on improving each of these areas for this company. Rate these using a scale of 1 to 5, where 1 = Not Important, 3 = a side project, and 5 = Very Important.
   a. Cost and Expense Management: _____
   b. Investments: _____
   c. Working Capital Management: _____
   d. Sales and Growth Expansion: _____
   e. Management Retention: _____
   f. Management Incentives: _____

7) Overall, how successful was the original management team in carrying out the management plan?
   a. Above Expectation
   b. At Expectation
   c. Below Expectation

8) Please list if there were any other unforeseen problems or issues that led to performance straying from expectation?
   a. Market Conditions
      i. If so, please explain:
   b. Poor Marketing Campaign
   c. Ineffective R&D performance
   d. Product development delays
   e. Inability to reduce Costs and Expenses
   f. Unforeseen physical damage (i.e. fires, thefts, etc.)
   g. Litigation issues
   h. Opposition from Employees and/or Labor Unions
   i. Access to Credit financing
   j. Management disagreements
   k. Breach of Covenants

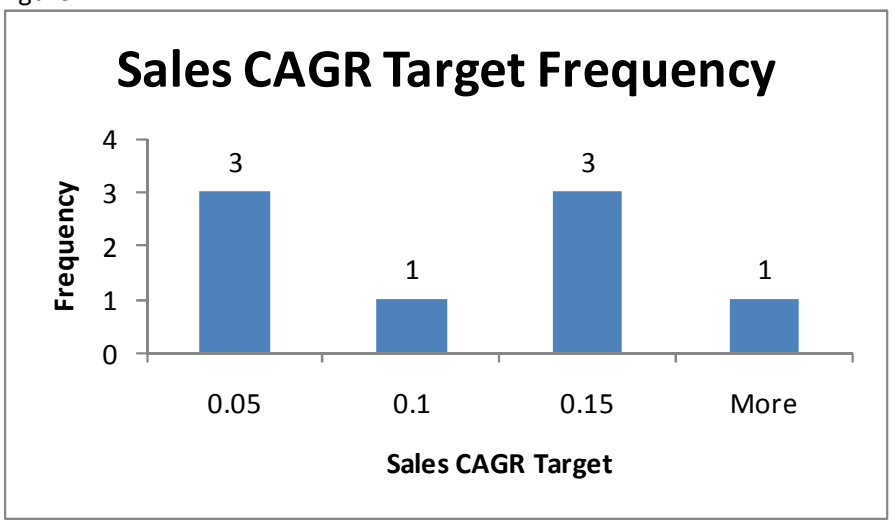
Appendix B

Figure B.1



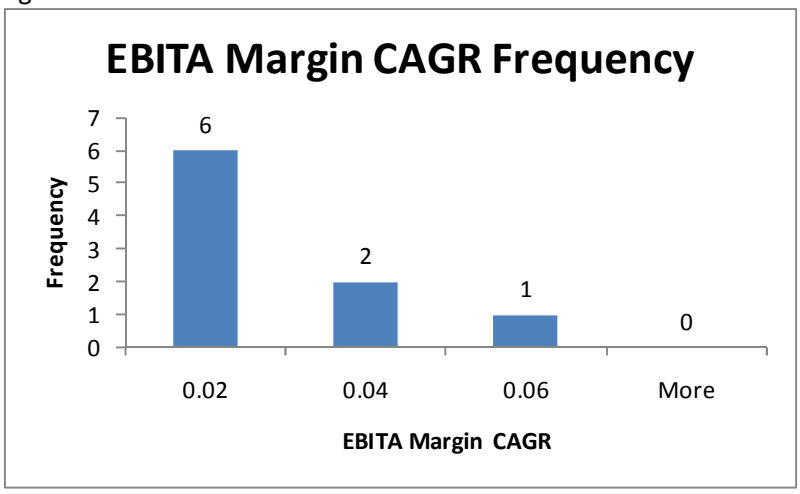
Notes: Figure B.1 shows the frequency breakdown for annual sales growth in our sample, broken down into pools of 0-5%, 5-15%, 15-25%, 25-35%, and 35%+.

Figure B.2



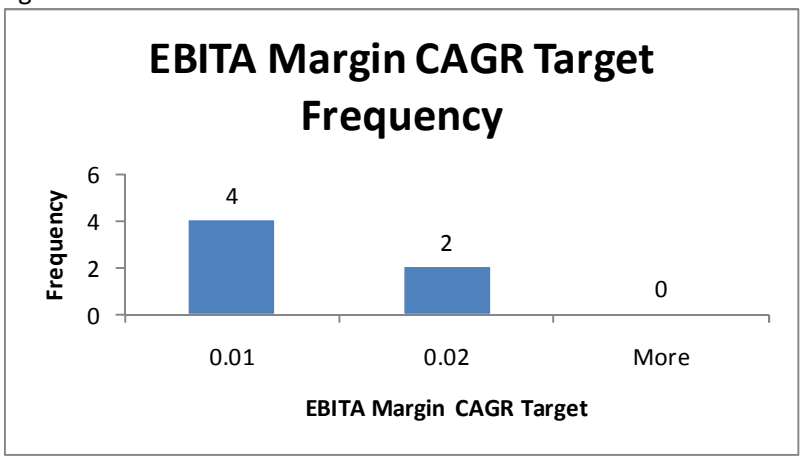
Notes: Figure B.2 shows the frequency breakdown for annual sales growth target in our sample, broken down into pools of 0-5%, 5-10%, 10-15%, and 15%+.

Figure B.3



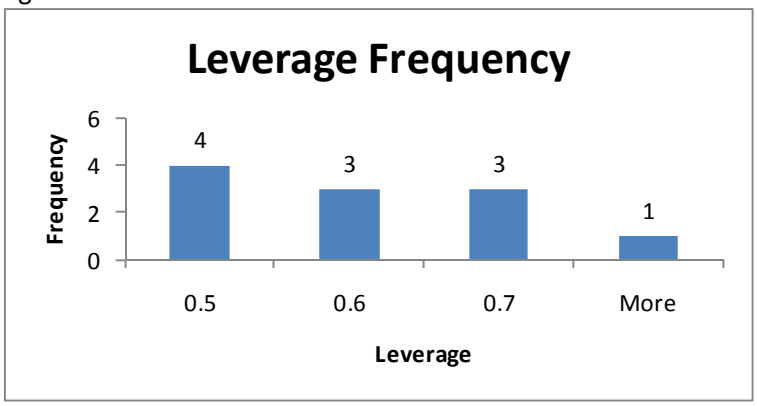
Notes: Figure B.3 shows the frequency breakdown for annual EBITA margin growth in our sample, broken down into pools of 0-2%, 2-4%, 4-6%, 6%+.

Figure B.4



Notes: Figure B.4 shows the frequency breakdown for annual EBITA margin growth target in our sample, broken down into pools of 0-1%, 1-2%, and 2%+.

Figure B.5



Notes: Figure B.5 shows the frequency breakdown for the leverage ratio in our sample, broken down into pools of 0-50%, 51-60%, 61-70%, 71%+.

Appendix C – Kendall's Tau Test Results

Table C.1 Tau-test Results, all hypotheses

	Hypothesis 1a: IRR and Sales CAGR	Hypothesis 3a: IRR and Sales CAGR Target	Hypothesis 1b: IRR and EBITA Margin CAGR	Hypothesis 3b: IRR and EBITA Margin CAGR Target	Hypothesis 4: IRR and Leverage
Number of Observations	11	9	9	6	11
Kendall's tau-a	0.5273	0.7222	0.5000	0.6000	-0.1091
Kendall's tau-b	0.5273	0.7222	0.5000	0.6000	-0.1101
Kendall's score	29	26	18	9	-6
SE of score	12.845	9.592	9.592	5.323	12.806
P-value (2-sided)	0.0293**	0.0091***	0.0763*	0.1329	0.6962
P-value (1-sided)	0.0147**	0.0045***	0.0382**	0.0665*	0.3481

*10% significance level **5% significance level ***1% significance level

Notes: The table presents test statistics for hypotheses 1a, 3a, 1b, 3b and 4, concerning correlation between IRR and Sales CAGR, Sales CAGR target relative performance, EBITA margin CAGR, EBITA margin CAGR target relative performance and deal leverage, respectively. Target relative performance is calculated by subtracting the target CAGR (for the planned holding period) from the actual CAGR (for the realized holding period). Kendall's tau-a is equivalent to Kendall's tau-b in all cases, but for Leverage, where tied values occur, and the tau-b statistic is more accurate. Kendall's tau takes values between -1 and 1, with large absolute value suggesting correlation between the tested variables. The distribution of the test statistic is approximately normal, and Kendall's score approximately 1.96 larger than its Standard Error will result in 5% significance. P-values at the 10%, 5% and 1% levels are marked with *, **, and ***. Two sided test is a standard choice for all hypotheses, but one-sided test could be argued to be satisfactory for all but leverage hypothesis, based on findings from previous studies, as discussed in the Literature Review section.

Appendix D – Fisher's Exact Test Results

Table D.1 Hypotheses 2a & 3a – Sales and EBITA CAGR Target Achievement vs. High/Low IRR

IRR		Sales CAGR Target Achieved			EBITA Margin CAGR Target Achieved		
		Yes	No	Total	Yes	No	Total
High	Expected	3.9	1.1	5.0	2.0	2.0	4.0
	Observed	5.0	0.0	5.0	2.0	2.0	4.0
Low	Expected	0.9	3.1	4.0	1.0	1.0	2.0
	Observed	2.0	2.0	4.0	1.0	1.0	2.0
Total		7.0	2.0	9	3.0	3.0	6
Fisher's Exact		0.167		-	1.000		-

Notes: The table reports the number of observations (deals) for which Sales and EBITA Margin Targets were reported. The third column contains counts of deals where Sales CAGR Target was met with respect to IRR pools (above and below average), and compares them with expected counts, should IRR and Sales CAGR Target achievement be independent. The fourth column contains counts of deals where the target was not met. The fifth column lists the category subtotals, except for the cell in fifth row, where the subsample grand total is reported. Columns 6, 7 and 8 contain the same information regarding relationship between achievement of EBITA Margin Targets and IRR, as columns 3, 4, and 5 respectively. Smaller subsample size means there have been less instances in which PE funds notified us about the planned EBITA margin level at the end of the holding period. The reported test statistic, Fisher's Exact serves the role of p-value. For instance, for the result to be considered significant at 10%, FE cannot exceed 0.1. FE takes values between 0 and 1. Fisher's Exact Test is recognized for its low power, and we will treat any result different from 1.000 with caution.

Table D.2 Hypotheses 5a & 5b – Management Team and BoD Enhancement vs. High/Low IRR

IRR		Management Team Enhancement			Board of Directors Enhancement		
		Yes	No	Total	Yes	No	Total
High	Expected	3.2	0.8	4.0	3.1	0.9	4.0
	Observed	3.0	1.0	4.0	4.0	0.0	4.0
Low	Expected	4.8	1.2	6.0	3.9	1.1	5.0
	Observed	5.0	1.0	6.0	3.0	2.0	5.0
Total		8.0	2.0	10	7.0	2.0	9
Fisher's Exact		1.000		-	0.444		-

Notes: The table reports the number of observations (deals) for which presence or absence of Management and/or Board of Directors enhancement events were reported. The third column contains counts of deals where Management Team was changed, with respect to IRR pools (above and below average), and compares them with expected counts, should IRR and Management Enhancement be independent. The fourth column contains counts of deals where no change was forced on the management team after acquisition. The fifth column lists the category subtotals, except for the cell in fifth row, where the subsample grand total is reported. Columns 6, 7 and 8 contain the same information regarding relationship between Board of Directors enhancement and IRR, as columns 3, 4, and 5 respectively. Smaller subsample size means there have been fewer instances in which PE funds notified us about their actions towards BoD

after the transaction. The reported test statistic, Fisher's Exact serves the role of p-value. For instance, for the result to be considered significant at 10%, FE cannot exceed 0.1. FE takes values between 0 and 1. Fisher's Exact Test is recognized for its low power, and we will treat any result different from 1.000 with caution.

Table D.3 Sales as the more important strategic goal vs. High/Low IRR

IRR		Sales More Important than Margins			Sales More Important than Investments			Sales More Important than WC Management		
		Yes	No	Total	Yes	No	Total	Yes	No	Total
High	Expected	3.0	3.0	6.0	3.5	2.5	6.0	4.0	2.0	6.0
	Observed	4.0	2.0	6.0	4.0	2.0	6.0	4.0	2.0	6.0
Low	Expected	3.0	3.0	6.0	3.5	2.5	6.0	4.0	2.0	6.0
	Observed	4.0	2.0	6.0	3.0	3.0	6.0	4.0	2.0	6.0
Total		8.0	4.0	12	7.0	5.0	12	8.0	4.0	12
Fisher's Exact		0.567		-	1.000		-	1.000		-

Notes: The table reports how important sales expansion was, as compared to three other strategies (margin improvement, capital investments, working capital management). The third column contains counts of deals where sales expansion was more important than margins, with respect to IRR pools (above and below average). It compares them with the expected counts, should the preference for sales expansion over margin improvement as a lead strategy be not correlated with IRR at all. The fourth column contains counts of deals where sales expansion was not perceived as being more important than margin improvement. The fifth column lists the category subtotals, except for the cell in fifth row, where the subsample grand total is reported. Columns 6, 7 and 8 contain the same information regarding relationship between PE fund's preferences for sales oriented strategy over investment focused one and IRR, as columns 3, 4, and 5 respectively. Columns 9, 10, 11, repeat the process for Sales and WC management oriented strategies. The subsample sizes are uniformly equal to the complete sample; since we were able to process the variables for all cases from the sources we collected (Questionnaires and Investment Reports). The reported test statistic, Fisher's Exact serves the role of p-value. For instance, for the result to be considered significant at 10%, FE cannot exceed 0.1. FE takes values between 0 and 1. Fisher's Exact Test is recognized for its low power, and we will treat any result different from 1.000 with caution.

Table D.4 Margins as the more important strategic goal vs. High/Low IRR

IRR		Margins More Important than Sales			Margins More Important than Investments			Margins More Important than WC Management		
		Yes	No	Total	Yes	No	Total	Yes	No	Total
High	Expected	1.0	5.0	6.0	4.0	2.0	6.0	4.0	2.0	6.0
	Observed	1.0	5.0	6.0	4.0	2.0	6.0	5.0	1.0	6.0
Low	Expected	1.0	5.0	6.0	4.0	2.0	6.0	3.0	3.0	6.0
	Observed	1.0	5.0	6.0	4.0	2.0	6.0	2.0	4.0	6.0
Total		2.0	10.0	12	8.0	4.0	12	7.0	5.0	12
Fisher's Exact		1.000		-	1.000		-	1.000		-

Notes: The table reports how important margin improvement was, as compared to three other strategies (sales expansion, capital investments, working capital management). The third column contains counts of deals where margin improvement was more important than sales, with respect to IRR pools (above and below average). It compares them with the expected counts, should the preference for margin improvement over sales expansion as a lead strategy be not correlated with IRR at all. The fourth column contains counts of deals where margin improvement was not perceived as being more important than sales expansion. The fifth column lists the category subtotals, except for the cell in fifth row, where the subsample grand total is reported. Columns 6, 7 and 8 contain the same information regarding relationship between PE fund's preferences for margin oriented strategy over investment focused one and IRR, as columns 3, 4, and 5 respectively. Columns 9, 10, 11, repeat the process for margins and WC management oriented strategies. The subsample sizes are uniformly equal to the complete sample; since we were able to process the variables for all cases from the sources we collected (Questionnaires and Investment Reports). The reported test statistic, Fisher's Exact serves the role of p-value. For instance, for the result to be considered significant at 10%, FE cannot exceed 0.1. FE takes values between 0 and 1. Fisher's Exact Test is recognized for its low power, however seeing only 1.000 results is a rather convincing argument for lack of correlation.

Table D.5 Investments as the more important strategic goal vs. High/Low IRR

IRR		Investments More Important than Sales			Investments More Important than Margins			Investments More Important than WC Management		
		Yes	No	Total	Yes	No	Total	Yes	No	Total
High	Expected	5.5	0.5	6.0	2.0	4.0	6.0	2.0	4.0	6.0
	Observed	6.0	0.0	6.0	2.0	4.0	6.0	2.0	4.0	6.0
Low	Expected	5.5	0.5	6.0	2.0	4.0	6.0	2.0	4.0	6.0
	Observed	5.0	1.0	6.0	2.0	4.0	6.0	2.0	4.0	6.0
Total		11.0	1.0	12	4.0	8.0	12	4.0	8.0	12
Fisher's Exact		1.000		-	1.000		-	1.000		-

Notes: The table reports how important capital expenditure was, as compared to three other strategies (sales, expansion, margin improvement, working capital management). The third column contains counts of deals where capital investments were more important than sales, with respect to IRR pools (above and below average). It compares them with the expected counts, should the preference for capital expenditures over sales expansion as a lead strategy be not correlated with IRR at all. The fourth column contains counts of deals where capital expenditure was not perceived as being more important than sales expansion. The fifth column lists the category subtotals, except for the cell in fifth row, where the subsample grand total is reported. Columns 6, 7 and 8 contain the same information regarding relationship between PE fund's preferences for investment oriented strategy over margin focused one and IRR, as columns 3, 4, and 5 respectively. Columns 9, 10, 11, repeat the process for investments and WC management oriented strategies. The subsample sizes are uniformly equal to the complete sample; since we were able to process the variables for all cases from the sources we collected (Questionnaires and Investment Reports). The reported test statistic, Fisher's Exact serves the role of p-value. For instance, for the result to be considered significant at 10%, FE cannot exceed 0.1. FE takes values between 0 and 1. Fisher's Exact Test is recognized for its low power, however seeing only 1.000 results is a rather convincing argument for lack of correlation.

Table D.6 WC Management as the more important strategic goal vs. High/Low IRR

IRR		WC Management More Important than Sales			WC Management More Important than Margins			WC Management More Important than Investments		
		Yes	No	Total	Yes	No	Total	Yes	No	Total
High	Expected	0.5	5.5	6.0	-	-	-	2.5	3.5	6.0
	Observed	1.0	5.0	6.0	-	-	-	3.0	3.0	6.0
Low	Expected	0.5	5.5	6.0	-	-	-	2.5	3.5	6.0
	Observed	6.0	0.0	6.0	-	-	-	2.0	4.0	6.0
Total		7.0	5.0	12	-	-	-	5.0	7.0	12
Fisher's Exact		1.000		-	-		-	1.000		-

Notes: The table reports how important WC management was, as compared to three other strategies (sales, expansion, margin improvement, capital investments). The third column contains counts of deals where WC management was more important than sales, with respect to IRR pools (above and below average). It compares them with the expected counts, should the preference for WC management over sales expansion as a lead strategy be not correlated with IRR at all. The fourth column contains counts of deals where WC management was not perceived as being more important than sales expansion. The fifth column lists the category subtotals, except for the cell in fifth row, where the subsample grand total is reported. Columns 6, 7 and 8 are empty, because there have been no cases where WC management would be more important than margin improvement. Columns 9, 10, 11, repeat the process for WC management and investments oriented strategies. The subsample sizes are uniformly equal to the complete sample; since we were able to process the variables for all cases from the sources we collected (Questionnaires and Investment Reports). The reported test statistic, Fisher's Exact serves the role of p-value. For instance, for the result to be considered significant at 10%, FE cannot exceed 0.1. FE takes values between 0 and 1. Fisher's Exact Test is recognized for its low power, however seeing only 1.000 results is a rather convincing argument for lack of correlation.

Appendix E – Strategic Goals Importance Score

Table E.1 – Scores of importance in overall deal strategy (3 – highest, 1 – lowest)

Strategic Goals	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Case 11	Case 12
Sales Expansion	2	3	3	2	3	3	3	3	2	3	3	3
Margin Improvement	3	2	2	2	2	2	2	3	3	3	2	3
Investments	2	1	1	3	1	3	3	1	1	1	3	2
WC Management	2	2	2	2	1	2	2	3	3	2	2	2

Notes: All scores are either converted from 1-5 scale used in the Questionnaire, using the rule formula $n = o/2$, rounded upwards, where n is the new score and o is the old score. If a strategy was prioritized in the investment report it was awarded 3 points, if it was mentioned as a secondary goal, it was given 2 points, and no mention at all resulted in 1 point being assigned.

Appendix F – Rank Converted Variables Sorted by IRR Rank

Table F.1 – Rank converted ratio variables

IRR	Sales CAGR	EBITA margin CAGR	Deal Leverage	Sales CAGR vs target	EBITA margin CAGR vs target
1	1	2	10	1	1
2	4	1	2	6	3
3	5	5	-	8	6
4	2	9	9	2	4
5	7	-	6.5	5	-
6	6	4	1	-	-
7	-	-	8	3	-
8	11	3	3	7	2
9	3	6	11	9	5
10	9	-	6.5	4	-
11	10	7	4	-	-
12	8	8	5	-	-

Notes: The conversion to ranks is necessary for the Kendall's Tau Test. Ties are reported as fractions of the whole numbers. If *x* amount of variables are tied on one rank, the next rank is *x* levels lower than the tied one. There is one tie between two values, at the 6^{th} rank in deal leverage, and the next rank, instead of having the number 7, is at 8.