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Governed by the Owner or Governed by Debt?

The impact of a change in ownership and financial debt on the working capital management of private equity buyouts in Sweden

Josefine Lundquist

24501@student.hhs.se

Wilhelm Michaelsen

24514@student.hhs.se

Abstract

This study examines the impacts of a change in ownership and financial debt on the working capital management of private equity buyouts in the Swedish market. Based on a sample of 134 Swedish buyouts that occurred between the second half of 2009 and first half of 2017, we first analyze the three post buyout-year changes in net working capital, defined as inventory + accounts receivable – accounts payable, followed by investigating the relationship between financial debt/assets and net working capital metrics using post buyout-year panel data. We find significant evidence that net working capital/sales, accounts receivable/sales and inventory/sales have been reduced in the buyout companies compared to pre-buyout levels. Moreover, multivariate regression indicates weak and non-significant negative relationships between financial debt/assets and net working capital/sales, inventory/sales and accounts receivable/sales and non-significant positive relationship between financial debt/assets and accounts payable/sales. Results suggest that a change in ownership to private equity has significant impact on a company's working capital management, potentially explained by the concentrated ownership structure translating into more scrutiny over management decisions, while the observed effects of debt have weaker explanatory value. In conclusion, evidence presented in this study resonates with a notion that the working capital management of buyouts is governed by the owner, and less governed by debt.

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Keywords: Working capital management, Agency theory, Private equity, Financial debt

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1. INTRODUCTION

1.1 Background

Working capital management is often denoted as an indicator of general company management efficiency and therefore a component of firm value. Activities such as managing inventory levels, deciding upon customer credit policies, and negotiating payables terms all affect the amount of cash that a business ties up in its daily operations, while the performance of each component may impact both profitability and liquidity. Working capital management can as such provide competitive advantages in optimizing the use of current resources, but also prevent growth and hamper cash conversion if monitored poorly.

Consequently, the ability to control working capital becomes a relevant objective for many stakeholders, and arguably so for a company's capital providers. Equity owners and debt holders' returns are ultimately derived from how well a business is managed, suggesting that they have an interest in increasing scrutiny over management's working capital decisions. However, it also emphasizes an interest in understanding how and to what extent ownership and debt positions impact the level of working capital that company managers choose, or not choose, to have.

One way of understanding the influence of ownership and debt on management decisions is to turn to agency theory (Jensen & Meckling 1976) which describes the relationship between principals (shareholders) and agents (managers) in an organization. When the former party delegates responsibility to the latter to make decisions that maximize firm value, a difference in personal incentives may lead the agent to act in ways not desired by the principal, resulting in agency costs. Related to working capital management, this could be management keeping inventory levels above operational necessities or accepting credit terms below market standards. Efforts to minimize such agency problems relate on the one hand to the equity owners as principals closely monitoring management decisions. On the other hand, raising debt is another factor reducing agency cost related to wasteful spending by managers, as a high debt burden increases pressure on liquidity (Jensen & Meckling 1976).

Related to both factors, private equity is a type of ownership typically associated with increased focus on working capital while at the same time using debt as an integral source of capital to fund investments in portfolio companies. Well-cited research from the U.S. largely confirms that private equity backed leveraged buyouts (LBOs) are related to tightened control of working capital. Findings include sharp reductions of inventory and receivables compared to pre-buyout levels (Easterwood et al. 1989), significantly lower inventory/sales ratios in the

first year post transaction (Kaplan 1989), and overall lower working capital in reversed LBO firms versus their industry peers (Holthausen & Larcker 1998). Moreover, a study by Wright et al. (1992) found similar results for leveraged buyouts in the U.K. and suggested that the observed incidences of working capital improvements were driven by an increased need for company managers to meet external finance commitments, including both those of the private equity sponsor and debt holders. This view is supported by more recent reports on private equity practices across Europe and the U.S., highlighting that the mere change in ownership to private equity leads to more frequent working capital initiatives (Braghin et al. 2020), however that the firm's relatively large debt position is an important contributor to this (Siemes & Schouten 2017). At the intersection of prior research and current practice, there seems to still be uncertainty around the determinants of working capital management in buyouts. Is it rather governed by the owner, or governed by debt?

According to Easterwood et al. (1989) private equity sponsors have an important governing role in its portfolio companies' strategic and operational objectives derived from a substantial concentration in ownership paired with a value-maximizing interest. The concentrated ownership allows for the owner to act as a powerful monitor of managers' decisions while incentivizing them to reach objectives such as increasing cash generation and productivity. Related to working capital management, the considerably decreased autonomy of managers could thus help prevent value destroying behavior such as excess investment in working capital. Consistent with agency theory, this suggests that a firm whose ownership is concentrated to private equity helps to reduce agency costs. However, another theory to explain why private equity as a specific ownership type outperforms other types of ownership in companies' operational performance has been summarized by research as the "parenting advantage" (Bergström et al. 2007; Berg & Gottschalg 2005). The advantage includes special knowledge, capabilities, and network advantages that private equity firms often have. In essence, the parenting effect works as a guiding principle for why a change in ownership to private equity *per se* has an impact on operational metrics after a buyout, including improvements to working capital.

Apart from ownership-related factors, the pure utilization of debt is another studied determinant of working capital management in its potential to reduce agency costs. As previously emphasized, this stems from the use of debt putting additional pressure on liquidity including mandatory amortization and interest payments. According to Jensen (1986), this limits cash flow at disposal for executives to pursue value-decreasing behavior such as investing in negative net present value projects. Building on this argument, a high debt burden could

therefore prevent managers from adopting loose working capital policies leading to inefficient use of current resources. Prior studies of debt as a determinant of working capital management support this notion, presenting significant negative relationships between a firm's debt ratio and working capital requirements for listed firms in Taiwan (Chiou et al. 2006) and Pakistan (Nazir & Afza 2009). The evidence implies that companies with higher levels of debt often operate with lower levels of working capital. However, the geographical focus might contribute to the results while emphasizing a relevance to investigate if the same relationships can be found for ownership types outside publicly traded markets. Overall, the aforementioned papers could not draw conclusions around the relative importance of debt versus ownership for the working capital management of companies, suggesting there is a research gap needed to be filled under this topic.

1.2 Purpose

The purpose of this thesis is to examine the impacts of a change in ownership and financial debt on the working capital management (WCM) of private equity (PE) buyouts in the Swedish market, and to help gain insight to underlying determinants of WCM in general while focusing on the governing roles of PE ownership and debt in particular. While historical buyout research confirms that highly debt-burdened PE buyouts in the 1980s-90s U.S. and U.K. have seen significant reductions in working capital measures (Easterwood et al. 1989; Kaplan 1989; Holthausen & Larcker 1998; Wright et al. 1992), we believe it is of interest to test if these conclusions hold true in more recent time periods. Furthermore, the question of what factors actually drive this development in buyouts remains largely unanswered. In general, private ownership and debt as co-functioning governing roles of WCM are areas yet to explore, and even more so in European markets where previous literature is limited. To the best of our knowledge, there has been no study made on the Swedish market which investigates the impact on WCM in buyouts while examining debt versus ownership as underlying drivers. This study therefore aims to provide answers to the following research questions: *Do Swedish buyouts experience significant reductions in net working capital? How does the buyout's financial debt position impact its net working capital?*

The study is based on a total sample of 134 PE buyouts in Sweden between the second half of 2009 and the first half of 2017. To answer the first question, we analyze the three post-buyout year changes in the net working capital/sales ratio compared to pre-buyout levels, including

separate analyses of inventories, receivables and payables (all in relation to sales). For the second research question, we perform multiple regressions on post-buyout panel data to analyze the relationship between the financial debt ratio and net working capital ratios. To provide insight into other potential drivers, we also control for several variables that have been shown in previous research to be linked to WCM, such as industry effects, firm size, age and return on assets. Lastly, we aim to compare and contrast the results from each test on the back of a theoretical framework based on agency theory (Jensen & Meckling 1976). This ultimately aims to evaluate whether the WCM of Swedish buyouts is rather governed by the owner, or governed by debt.

1.3 Contribution

Firstly, this study complements previous research on working capital management and its underlying determinants focusing on ownership factors and debt (see e.g. Nakamura & Palombini 2012; Chiou et al. 2006; Nazir & Afza 2009; Kieschnick et al. 2006). On the one hand, we study the ownership impact from a *change* in ownership while looking through a private equity perspective in the Swedish market, as opposed to the above studies having focused on static ownership characteristics of listed firms in international markets. On the other hand, we investigate the explanatory value of agency theory (Jensen & Meckling 1976; Eisenhardt 1989) and the relative power to reduce agency costs through debt (Jensen 1986) versus the PE ownership impact on management monitoring mechanisms (Easterwood et al. 1989). From this evaluation, the PE parenting advantage could provide insight to how and why PE as a specific ownership type is the more powerful factor suggesting that its focus to control working capital is a lever of value creation (Bergström et al. 2007; Berg & Gottschalg 2005)

Secondly, this study tests the robustness of the conclusions of historical studies performed on post-buyout development in net working capital (NWC) components finding that buyouts are associated with increased control, i.e. lower levels, of working capital (Kaplan 1989; Easterwood 1989; Holthausen & Larcker 1998 in the US; Wright et al. 1989 in the U.K.). The fact that these studies were performed in the late 80's-90's in the U.S. and U.K. also suggest that there is a need to investigate the topic further in more recent time periods and in other markets. With our study focusing on Swedish buyouts between 2009-2017, it therefore adds value by providing more insight to drivers of working capital management (WCM) in PE-owned companies in modern time periods.

Finally, this study adds to more recent research on operational performance in buyouts in which WCM has not been explicitly analyzed, but where improved WCM has been proposed to be a lever of buyout value creation (Bergström et al. 2007; Berg & Gottschalg 2005; Guo et al. 2011). If we find that our sample of Swedish buyouts experience reductions of net working capital, this translates into an increase of internal funds that may function to generate incremental value such as through dividends or improved return on capital, furthermore supporting the arguments presented in the aforementioned studies.

1.4 Delimitations

This thesis is delimited to private equity backed buyouts in Sweden occurring between 2009-2017, and where the holding period is at least three years. As such, the data analyzed in this thesis excludes the years directly after the financial crisis (2008) and the Covid-19 crisis (2020) to account for potentially distressing macroeconomic effects on businesses' normal operations.

To ensure a holistic view of the phenomenon in the Swedish market, we include both Swedish and foreign PE-sponsors in the sample, while focusing solely on Sweden-based target companies as we can assure access to (private) company filings required for retrieving relevant data. The studied sample excludes secondary buyouts, i.e. where the seller was another private equity firm, and where the target was a financial institution, such as an insurance company or a bank, as it is structured differently. Lastly, we only include buyouts where the ownership stake is a minimum of 50% for the private equity firm to obtain significant control over the target business and related operational decision-making power.

Potential risks and limitations of our sample delimitation and gathering method is further described in section 7.5.

1.5 Disposition

The study is divided into seven sections. Section 2 includes the explanation of general concepts around working capital management (WCM), followed by section 3 describing the theoretical framework guiding the forthcoming analysis and interpretation of results. Section 4 presents previous empirical findings on ownership and debt-related determinants of WCM, WCM in private equity buyouts as well as researchers' suggested explanations for the observed results. On the back of this, section 5 presents our hypotheses, while section 6 outlines a description and explanation of the methodological approach used in this study, including data collection and sample description, variables selection and specification of statistical models. Moreover,

section 7 presents our empirical results including descriptive statistics and model output, followed by analysis and discussion of the implications of these results in section 8. Then, we present suggestions for future research in section 9 and conclude the study in section 10.

2. OVERVIEW OF CONCEPTS

2.1 Net Working Capital and Working Capital Management

Working capital, also known as net working capital (NWC), is traditionally defined as the difference between current assets and current liabilities on a firm's balance sheet. Besides cash at hand, major components of NWC that directly relate to a business's core operations are the assets of accounts receivable and inventory, and liabilities of accounts payable. The asset balance represents the (cash) investment needed in a business's fundamental operations, where short-term liabilities can be used to fund this need partially or fully. Ultimately, the amount of working capital locked in each of these components determines the gap between needs and sources of funds to run a business, i.e. what is financed by short-term liabilities versus long-term debt. Therefore, decisions related to levels of working capital tied in a business are of critical importance for managers in their strategic decision making (Preve & Sarria-Allende 2010, pp.15-18). Working capital management (WCM) refers to these often short-term decisions, and can act as an important function in the balancing of trade-offs between risk and return as well as profitability and liquidity (Nakamura & Palombini 2012; Appuhami 2008).

As working capital is not directly tied to profitability but rather liquidity, the modern view is that high levels are undesirable as it creates a lag on financial performance (Sagner 2010, pp. 13-14). Keeping low inventory and tightening customer terms to decrease accounts receivable are common initiatives to reduce current assets, while extending credit terms to increase accounts payable is emphasized to minimize the net operating funding gap.

2.2 Introduction to Private Equity

Private equity (PE) is an investment form that acquires and owns (often majority stakes) in non-listed equity for a limited holding period. Investments tend to be deployed through funds, in which limited partners (institutional investors and wealthy individuals) invest capital and the PE firm manages the fund. The aim is to create returns by driving operational and financial improvements in the portfolio companies, and once the holding period ends divest them, close the fund and realize returns to investors (Kaplan & Strömberg 2009).

Potential ways for PE-sponsors to create value in its portfolio companies are according to Jensen (1986) through governance, financial and operational engineering. Governance relates to aligning managers' interest to make business decisions that maximizes value of the firm, for example by offering insider equity ownership (Kaplan & Strömberg 2009). In a similar manner, PE firms can decrease agency costs by using high levels of debt to reduce the risk of managers pursuing value-destroying projects (Jensen 1986), while the tax shield from debt is another form of value creation through financial engineering (Kraus & Litzenberg 1973). According to Kaplan and Strömberg (2009) PE buyouts are usually characterized by high levels of leverage with financing structures between 50 to 90 percent of debt - hence the term leveraged buyout (LBO). The authors note that for buyouts in the 1980s-90s, bank debt was the primary constitutor of this.

Lastly, PE firms drive value through operational engineering including growth, cost reduction and capital efficiency improvements (Gompers et al. 2016). Over the last 30 years, a gradual shift in the strategy of PE firms' value creation has been observed. While multiple expansion and revenue growth were key drivers in the 1990s and 2000s (Braghin et al. 2020), improving portfolio companies' operational effectiveness has become a more recently acknowledged phenomena and focus area in the evolution of buyout value creation. It stems from a need for equity sponsors to find alternative value drivers to financial engineering¹ as competition increases and markets mature (Berg & Gottschalg 2005). In contrast to mere refinancing with additional debt, PE-firms have increasingly adapted their investment strategies to this, where improving working capital management (WCM) is one of the levers (Alvarez & Jenkins 2007).

2.3 Private Equity Ownership and Working Capital Management in Practice

According to Alvarez and Jenkins (2007), private equity (PE) sponsors typically implement targets for working capital reductions in their portfolio companies as a way to improve operational efficiency and profitability. Initiatives are assessed with cost minimization as a primary goal, while cash flow optimization is increasingly prioritized. The authors argue that PE-firms therefore often supplement their acquired companies' management with interim roles in operations critical areas, such as supply chain management. While strengthening the initial

¹ Optimizing capital structure (i.e. mix of debt + equity) and minimizing after-tax cost of capital are considered to be well-known and historically typical ways for buyout sponsors to generate returns (Berg & Gottschalg, 2005)

team's skillset, it also helps with developing capabilities in-house and executing more effectively on performance improvement plans including working capital targets.

Referring to working capital management (WCM) as an indicator of how well a business is managed, improvements to such metrics could provide PE-buyouts with competitive advantages. For example, in a PwC report from 2017 covering 750 companies across different industries in Western Europe, it was shown that PE-backed companies had an average ~30% less cash locked in working capital and significantly shorter cash conversion cycles than their publicly listed peers. The main drivers to this result were found to be higher days of payables and lower inventory levels in PE-backed versus non-PE-backed firms. However, beyond improving the financial performance of buyout companies, better WCM practices could also benefit underlying processes such as supply control and customer payment collection processes (Siemes & Schouten 2017). In terms of planning for WCM initiatives, PE-sponsors tend to investigate upsides or red flags related to potential improvements already during pre-deal negotiations (Braghin et al. 2020) implying that WCM is a topic of great importance to PE-sponsors when evaluating investments. The authors collected data on practices of PE-backed firms across the U.S. and Europe, and confirmed that while the former is also true, working capital initiatives typically are executed upon the first year post buyout.

What factors are driving this development? Practitioners have emphasized that a mere change in ownership to PE leads to an increased focus on WCM, however that the buyout company's relatively large debt position might be an important contributor (Siemes & Schouten 2017). A guiding principle to help explain the dynamics between managers' WCM decisions as a function of a firm's ownership and debt structure is the agency theory (Jensen & Meckling 1976; Eisenhardt 1989), described further in the following section.

3. THEORETICAL FRAMEWORK

3.1 The Agency Theory and Agency Costs

According to the agency theory (Jensen & Meckling 1976), an agency relationship is defined as *“a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves decision making authority to the agent”*. In an organizational context, the shareholders (owners) can be viewed as principals and the CEO/company managers as the agent(s) entrusted to make everyday business decisions and optimize the company's use of resources on the behalf of the owner's value maximizing interest.

Eisenhardt (1989) described the dynamics of agency theory as a way of addressing two problems that may arise in agency relationships – the first one occurring when the principal and agent do not share the same goals and desires and the second one arising when the two have different attitudes towards risk. Problems occur when the agendas of the parties are misaligned and when it is difficult and costly for the principal to monitor the agent. Stemming from an opportunistic and non-rational behavior of agents, a “principal-agent” conflict arises (Jensen 1994), meaning the decisions and interests of managers are not aligned with the shareholders’ value-maximizing objective. In a company with low monitoring mechanisms, this conflict causes agency costs, such as leading managers to (not) take on (positive) negative net present (NPV) value projects (Jensen & Meckling 1976).

One way of mitigating the cost of misaligned interests stems from the principals - i.e. shareholders - to increase the level of monitoring and put appropriate incentives in place that disciplines management decisions towards the objective of maximizing firm value. On the other hand, agency costs could also derive from the existence of excess free cash flow in the firm making managers more prone to invest in negative NPV projects or treat investment decisions more carelessly. In this regard, findings by Jensen (1986) have suggested debt to be another mitigator of agency costs, as it constitutes an additional financial commitment for managers to attend to while mandatory amortization and interest payments reduce cash at disposal. The following three sections discuss what this implies for the working capital management (WCM) of private equity buyouts.

3.1.1 Reducing Agency Cost through Ownership Concentration in Buyouts

According to Easterwood et al. (1989), private equity (PE) sponsors have an important governing role in its portfolio companies' strategic and operational objectives. Why this role is achieved is explained by the change in ownership structure that follows the buyout transaction in which the PE-sponsor becomes a major shareholder, typically along with some of the company’s top managers. The ownership becomes concentrated in the hands of the PE-firm while the portfolio company’s objectives will have changed compared to what they were in the pre-buyout company. Managers no longer respond to a fragmented ownership base of minor shareholders but are responsible to satisfy the interests of a small group of powerful equity investors. With significant control derived from its acquired equity stake, PE-sponsors act as a monitoring function over management decisions to help ensure that managers do not pursue individual goals over the goals of the firm to maximize economic value. The authors argue that this change in ownership structure decreases management’s autonomy considerably, while the

PE-firm works closely with them to target goals such as increasing cash generation and productivity - areas in which working capital management is named to provide significant improvement potential.

3.1.2 Reducing Agency Costs and Increasing Operational Efficiencies through Debt

A way of reducing the risk of wasteful spending by an agent, and thus the agency cost derived from a conflict of interest between shareholders and managers, is to take on a larger debt burden (Jensen 1986). The argument states that debt forces firms with positive cash flows but few high-return investment projects to distribute cash flow to investors instead of investing in low-return opportunities, hence increasing capital efficiency and reducing the risk of wasteful spending. Essentially, by facing the risk of missing interest payments and potentially even bankruptcy, management will be much less prone to waste money.

In the same article, Jensen (1986) applies the notion of debt to reduce agency costs specifically to private equity (PE) buyouts, formulated as the “free cash flow theory of takeovers”. It stipulates that leveraged buyouts usually occur in cases where internal control processes are weak, free cash flows are high and wasteful spending is common, suggesting that high levels of debt generate benefits by reducing agency costs and increasing returns for the PE owner. Jensen lays out examples of managers using internally generated funds to keep expanding despite excess capacity in the industry to benefit themselves. The debt created in buyouts then induces a form of “crisis” that forces managers to enact value-accretive initiatives, such as cost rationalization and sale of unprofitable assets, to be able to serve a substantially higher debt burden. As laid out by Jensen, such initiatives had a positive impact on share prices and shareholder value. Thus, the debt functions as a control measure, increasing scrutiny on managers and reducing agency costs.

This can potentially explain empirical findings that PE buyouts show reduced working capital post transaction. Management in the acquired companies, due to the heavier debt burden, is forced to optimize working capital management. This optimization could reduce the capital tied up in running the business and unlock cash necessary to service debt. Further, this supports a hypothesis that the increased debt is associated with lower working capital in buyout firms.

3.2 The “PE-firm Effect” and Parenting Advantage

Apart from ownership concentration and a higher debt burden, another explanation for why buyouts experience improvements in working capital could relate to what researchers deem a form of “parenting advantage” that private equity (PE) sponsors provide to its portfolio companies. Defined by Berg & Gottschalg (2005) as an “extrinsic” factor of value creation, the parenting effect is transferred through an interplay between the PE-sponsor and its portfolio companies that adds value to their performance during the holding period that they could not have generated solely with their own resources. Specialist expertise, strategic knowledge, contact network and industry experience deemed unique to an individual PE-firm are typical examples of the advantage a PE-owner brings according to this theory. Essentially, characteristics specifically related to PE sponsors compared to other forms of ownership may be critical for creating firm value. Bergström et al. (2007) explain that an important factor contributing to the advantage is the limited time a PE-firm holds a portfolio company. PE sponsors’ often pre-set investment horizons allow enough time to implement operational restructurings, and enough pressure to keep management motivated to realize value creative plans. The PE firm effect is also argued to increase over time as deal complexity, and hence the time required to realize relatedly complex value creation initiatives, increases (Castellaneta & Gottschalg 2016). This is because value generated through PE-firms’ improvement of operational activities (“value through addition”) is often related to longer buyout durations as compared to the mere competence of finding attractive targets (“value through selection”).

4. PREVIOUS RESEARCH

In the following sections 4.1.-4.3, we outline general findings from prior research on ownership-related factors and debt levels as potential determinants of working capital management (WCM). This is followed by what academic evidence on buyouts’ operating performance implies for the underlying drivers of WCM.

4.1 Impact from Ownership on Working Capital Management

Nakamura and Palombini (2012) examined the impact of management monitoring mechanisms and debt level on the cash conversion cycle (CCC) and working capital requirements (WCR) of 2,976 listed companies in the Brazilian market between 2001-2008. Although not statistically significant, results indicated a negative relationship between ownership concentration (>20% stake) and working capital management (WCM), including the measures of CCC, days of

inventory and days of accounts receivable. It suggests that companies with large investors are associated with less working capital, supporting that ownership has a governing role with regards to improving WCM. However, a significant (albeit low) positive relationship between presence of outside directors and WCR stood in contrast to the expected results, implying that a larger presence of external board members does not translate into more efficient WCM.

Kieschnick et al. (2006) investigated, among other factors, the impact of board characteristics and executive ownership on the cash conversion cycle (CCC) by analyzing panel data from companies in the U.S. between 1990-2004. This study found a significant negative relationship between the ratio of outside board members and the CCC, suggesting that working capital management is improved (i.e. the CCC is shorter) when a company has higher involvement from outside board members, explained by managers tending to respond actively to external monitoring of operations, including working capital practices.

4.2 Impact from Debt on Working Capital Management

Nakamura and Palombini (2012) found a significant negative relationship between debt level, the cash conversion cycle (CCC) and working capital requirements (WCR) in their study of Brazilian companies, suggesting that companies with high debt-burden operate with more efficient working capital management (WCM) as a way to avoid raising other sources of capital such as equity and bonds. Days of inventory were found to be significantly negatively associated with debt, while days of accounts payable were significantly positively correlated. The interpretation is that the more debt a firm has, it tends to work with lower inventory and negotiate for increased payment terms with suppliers.

Prior research on determinants of WCM in other geographical markets largely supports the same conclusion of higher debt being associated with lower working capital, with some variations. Nazir and Afza (2009) studied panel data of 204 non-financial listed companies in Pakistan between 1998-2006. They found a significant negative relationship between financial leverage and WCM, measured as the ratio of WCR to total assets. Chiou et al. (2006) did a similar study on quarterly data of a large set of listed companies in Taiwan between 1996-2004, and found significant support that firms with higher debt ratios tend to have lower WCR. Likewise, Mohamad et al. (2013) examined 150 publicly listed companies during a 10-year period in Malaysia, and found that debt was significantly negatively associated with WCR and the CCC. Contradicting these studies, however, were the results from Appuhami (2008) who examined the impact of capital expenses on WCM of listed firms in Thailand between 2000-

2005. The study found significant positive relationships between WCR and operating and finance expenses, as well as a (non-significant) positive relationship between debt and WCR, suggesting a tendency for firms with high levels of debt and related interest expenses to operate at higher levels of working capital.

4.3 Working Capital Management in Buyouts

To some extent, reductions of private equity (PE) buyout companies' capital requirements such as working capital has been reported to be an operational initiative intended for value creation through increasing the usage efficiency of existing assets (Berg & Gottschalg 2005). This concept of "operational rationalization" is linked to findings of significant reductions of working capital components in studies of leveraged buyouts (LBOs) in the U.S. and U.K. during the 1980s-90s. Easterwood et al. (1989) analyzes the typical consequences of ownership and capital structure changes on the strategic objectives of companies who have undergone an LBO. The study examines a sample of 49 large U.S. LBO transactions occurring between 1978-1985, presenting evidence of sharp reductions of inventory and receivables compared to pre-buyout levels. The author argues that working capital management (WCM) is an area offering significant potential for achieving improvements in cash flows, however that successful implementation often also requires adaptations of management systems. Kaplan (1989) studied the effects of management buyouts (MBO) on operating performance by analyzing a sample of 76 public U.S. MBO transactions between 1980-1986. He finds that post-buyout firms experience an approximate 10% decrease in inventory to sales ratio in the first year post transaction, with improved inventory management being a contributing factor. Holthausen and Larcker (1998) examined the financial performance of a sample of 90 reversed LBOs² that occurred in the U.S. between 1986-1987. For each analyzed year, the industry-adjusted working capital/assets ratio was found to be significantly and largely negative for the sample, indicating around 50% lower working capital levels in the post-LBO firms versus industry peers. Moreover, results indicated that increases of working capital after the public offering, i.e. in the post-LBO firms, were related to decreases in ownership concentration of insider equity ownership. As the PE-industry in Europe evolved, Wright et al. (1992) conducted a study on 182 LBO transactions in the U.K. between 1983-1986 to compare with prior findings from the U.S. The authors confirmed that tightening the control of, i.e. reducing working capital was

² A reversed LBO refers to a firm making its initial public offering after completing a leveraged buyout (Holthausen and Larcker 1998).

frequently initiated by managers in their sample. Among the U.K. buyout firms, 43.2% indicated a shortening of debtor days (days of accounts receivable) while 31.1% had extended creditor days (days of accounts payables) post buyout.

What is driving these incidents of working capital reductions in buyouts? Results from more recent academic research on buyout value creation suggest that private equity sponsors are inclined to reduce working capital levels of their portfolio companies to drive financial returns while sustaining higher levels of debt. Guo et al. (2011) studied leveraged buyouts completed between 1990-2006 in the U.S., and found a strong positive relationship between return on capital and improvement of cash flows. The authors provide a twofold explanation for why PE sponsor returns are amplified through reductions of working capital. On the one hand, the additional freed up cash can be used to meet requirements of increased interest payments and amortization derived from a higher debt burden. On the other hand, the cash could be used to pay additional dividends to equity holders. Similarly, Bergström et al. (2007) found significantly positive changes to return on invested capital in Swedish private equity backed buyout firms between 1998 and 2006. While they did not control for industry differences in working capital in their study, results indicated that value creation was enhanced via substantially improved capital management.

Overall, evidence from prior research presented above in section 4 suggests that there is a need for managers to increase control of working capital, namely by reducing it, after a change in ownership to private equity. The overarching explanation is that it serves the interests of external capital providers, emphasizing that both the level of debt and ownership concentration of equity holders could be of great importance for monitoring purposes in accordance with the agency theory. However, many prior studies on working capital management determinants lack insights about the relative importance of ownership versus debt, while implications are drawn from results of publicly listed firms. Moreover, a large portion of buyout research referred to in this thesis was made decades ago in markets outside Europe, so conclusions of these studies may not be fully applicable in a changing buyout environment nor in Sweden. Nevertheless, the essence of previous findings functions as a basis for what to test for and expect as results in our study, further outlined in our hypotheses in the following section.

5. HYPOTHESES

As stated, the purpose of this study is to investigate the impact of a change in ownership versus a company's financial debt position as the governing factors of Swedish buyouts' working capital management (WCM). To investigate this, we have formulated eight hypotheses that we

aim to study. The first set of hypotheses (H1-H4) relate to the governing role of the owner, while the second set of hypotheses (H5-H8) relate to the governing role of debt.

5.1 Impact from a Change to Private Equity Ownership on Working Capital Management

Guided by the agency theory, buyout literature suggests that private equity (PE) ownership is important for management monitoring purposes (Easterwood et al. 1989). This is furthermore confirmed by evidence on buyouts experiencing significant reductions in working capital metrics (Easterwood et al. 1989; Kaplan 1989; Wright et al. 1992; Holthausen & Larcker 1998) and significantly lower working capital than comparable firms (Holthausen & Larcker 1998). While both findings are in line with more recent reports on PE-practices (Siemes & Schouten 2017; Braghin et al. 2020), the latter also suggests that buyout firms may be equipped with a parenting advantage providing additional explanatory power to why PE ownership per se has an impact on working capital, hence that it is an ownership-based lever of value creation (Berg & Gottschalg 2005, Bergström et al. 2007). This notion is strengthened by researchers suggesting that PE sponsors have an inherent interest in reducing working capital in order to release cash and accelerate returns (Bergström et al. 2007; Guo et al. 2011). Based on all the above, our first and main hypothesis related to the governing role of the owner is:

H1: Net working capital/sales have been reduced in the buyout companies

Where net working capital is defined as inventory + accounts receivable - accounts payable. In order to understand the magnitude of the different underlying drivers to a potential change in overall net working capital, three additional hypotheses have been formulated:

H2: Inventory/sales have been reduced in the buyout companies

H3: Accounts receivable/sales have been reduced in the buyout companies

H4: Accounts payable/sales have increased in the buyout companies

5.2 Impact from a Buyout's Financial Debt Position on its Working Capital Management

Apart from ownership impact, the agency theory (Jensen & Meckling 1976; Eisenhardt 1989) suggests that a high debt burden is another factor to increase scrutiny over management decisions to reduce agency costs. In order to service debt commitments, amortization and interest payments puts pressure on increasing liquidity while reducing free cash flow, thereby

preventing wasteful spending by management (Jensen 1986). This argument implies that firms with high levels of debt, such as leveraged buyouts, are incentivized to operate under more streamlined working capital management practices and relatedly lower net working capital compared to firms having low levels of debt. Supported by the findings of previous literature showing that high debt levels are related with low levels of working capital in listed firms (Nakamura & Palombini 2012; Chiou et al. 2006; Nazir & Afza 2009), it is expected that this should hold true also for private equity buyouts. Moreover, buyouts' often relatively high debt positions in conjunction with the resulting change in ownership has been reported as an important contributor to the increased focus on working capital management (WCM) initiatives in practice (Wright et al. 1992; Siemes & Schouten 2017). On the back of this, we have formulated a second set of hypotheses with the main hypothesis being:

H5: There is a negative relationship between a buyout company's financial debt ratio and net working capital/sales ratio

Similar to H2-H4 above, we also investigate the relationships between the financial debt ratio, defined as interest bearing debt over assets, and net working capital components to analyze potential differences in underlying drivers:

H6: There is a negative relationship between a buyout company's financial debt ratio and inventory/sales ratio

H7: There is a negative relationship between a buyout company's financial debt ratio and accounts receivable/sales ratio

H8: There is a positive relationship between a buyout company's financial debt ratio and accounts payable/sales ratio

6. METHODOLOGY

In the following section 6, the different methodologies used to test for the aforementioned hypotheses H1-H8 will be described.

6.1 Data Collection

In order to investigate the respective importance of a change in ownership to private equity (PE) versus a company's debt position as potential determinants of working capital management (WCM), we have used data containing financial information on a larger set of PE-backed

buyout transactions taken place in the Swedish market between the *second half* of 2009 and *first half* of 2017. For the purpose of this study, we collected data from one year prior to the first buyout and three years after the last buyout. The time horizon of 3 years is similar to what Kaplan (1989) used in his study of the change in operational performance metrics after a buyout. Also, in line with the method used by Bergström et al. (2007), we choose to assign buyouts taking place during the *second half* of a year with the same year as base year (i.e. the year prior to a change in ownership), while buyouts taking place in the *first half* of the year have been assigned the year prior to the buyout year as the base year. This is done to assume full PE-ownership only when a company has been held during the majority of months in a given year. As such, data analyzed in this study consists of financial information reported between 2009 and 2019. Moreover, the chosen time period is made to account for the most recent buyouts having been made during a wide enough time span to include a sufficient number of transactions, while limiting potentially disrupting impacts from macroeconomic crises, referring to the financial crisis deemed to end in 2008, and the Covid-19 crisis coming into effect in 2020.

6.2 Description of Sample Selection

To retrieve our sample companies, screening on the mergers and acquisitions database MergerMarket was performed. While the database may not cover every Swedish buyout having taken place, we assume that there is no reason for systematic exclusion. Moreover, financial information used to calculate the metrics required for the quantitative analysis, as well as industry classification codes, were obtained from the databases Valu8 and Retriever. These are two similar databases containing annual reports and other required filings for Swedish registered companies and were used in conjunction to gather relevant data points such as sales, accounts receivable, accounts payable and inventory. Using two databases in addition to sample quality checks and manual input from annual reports allowed for cross-checking while minimizing the risk for systematic errors.

The initial screening on MergerMarket for sample companies yielded 406 transactions, based on the following criteria: i) Sweden-based companies ii) acquired by a private equity (PE) firm iii) between the second half of 2009 and first half of 2017. To further delimit our sample while strengthening the quality of our study, we made additional adjustments as follows: i) excluded companies for which the stake owned by PE-sponsors were not disclosed or was less than 50%. This is based on the assumption that majority ownership is required to have enough voting rights and decision power in order to implement strategic initiatives and

operating improvements embedded in a PE-firms' business model; ii) excluded banks and insurance companies to make the sample firms more accurately comparable, as financial institutions have inherently different business structures; iii) excluded transactions in which the previous owner was another PE firm, i.e. secondary buyouts. This was done firstly because a selling PE-firm probably already has done operational improvements during its holding period which makes it difficult to isolate the real PE-firm effect. Secondly, we argue that it makes the sample firms more appropriately suited to explore the potential impact on working capital management (WCM) due to a change in ownership type, and not just a change of ownership per se. The final adjustment we made to the sample was in terms of data availability, where iv) we chose to exclude companies for which required financials were missing and / or not comparable during its period of analysis. This was when a company merged with another entity shortly after it was acquired, which makes it difficult to compare pre- versus post-buyout performance of the initial target company. After these adjustments, we arrived at a sample of 134 Swedish buyouts.

The first set of hypotheses, H1-H4, studies the impact on WCM from a change in ownership by comparing the mean net working capital (NWC) metrics one year prior to acquisition (y-1) versus each of the three consecutive years after the buyout (y0, y1, y2). To conduct these tests, we had to further exclude some data points where data was not available for all four time periods. After these adjustments, 126 Swedish buyouts remained. In the tests of our second set of hypotheses H5-H8, further adjustments were made to arrive at a comprehensive panel data set. All firm-years with incomplete data across variables were excluded in order to perform a multivariate regression. Ultimately, this resulted in a final sample of 109 firms used in the regression. Table 1 below shows each step performed in order to obtain the final samples.

Table 1. Screening results

<u>Data screening summary</u>	
Initial transactions	406
Less: i) Non-majority transactions	-227
Less: ii) Bank & insurance	-2
Less: iii) Secondaries and holding per.	-14
Less: iv) Merged and financials n.a.	-29
Total sample	134
Less: v) Financials for all four time periods n.a.	-8
Used sample (T-test, H1-H4)	126
Less: vi) Incomplete panel data	-17
Used sample (Regressions, H5-H8)	109
Buyouts included in both tests	101

6.3 Variables Selection

The following section includes definitions and descriptions of all variables included in our study. Variables included in the T-test are the ones defined under 6.3.1, while the rest of independent variables and control variables refer to our regression model.

6.3.1 Dependent Variables

6.3.1.1 Net Working Capital and its Different Components

We define net working capital (NWC) as a percentage of sales as a given financial year's (t) end-of-balance inventory + accounts receivable - accounts payable, divided by sales, as:

$$NWC_t = \frac{Inventory_t + Accounts\ receivable_t - Accounts\ payable_t}{Sales_t} \quad (1)$$

We choose to express NWC in relation to sales as a % instead of turnover ratio, in order to use a relative measure that is also defined for when a company has negative NWC, which some of the buyout companies in our sample have. Moreover, cash is excluded from this metric, although it could be regarded as part of the working capital as cash required to run the daily operations. However, it is difficult to determine the amount of operating cash to include from the entire cash balance, which is why we choose to exclude it from the metric in our definition of NWC. Instead, we account for potential impacts from cash holdings as a control variable, explained further below in this section.

Moreover, we conduct separate analyzes for each constituent of NWC, defined similarly as NWC/sales for each financial year (t) as follows:

$$Inventory_t = \frac{Inventory_t}{Sales_t} \quad (2) \quad Accounts\ receivable_t = \frac{Accounts\ receivable_t}{Sales_t} \quad (3)$$

$$Accounts\ payable_t = \frac{Accounts\ payable_t}{Sales_t} \quad (4)$$

We have chosen to not include other current receivables or payables for the NWC definition than the ones defined. This was done to provide a similar interpretation as if the cash conversion cycle (CCC), including its components of average days of inventory, days of accounts receivable and payables, were to be analyzed. The CCC is a common measure of working capital management (WCM), and it quantifies the cash investment in working capital defined as the time lag between purchase expenditures and sale of finished goods. In that case, payables are often analyzed in relation to costs of sales / goods sold (COGS). However, due to many of

our sample firms not explicitly reporting COGS we made the decision to focus solely on NWC and its components in relation to sales to get a comprehensive and comparable set of metrics across our sample firms. This approach is similar to the *net trade cycle* defined by Shin and Soenen (1998) as $[\text{Inventory} + \text{Accounts receivable} - \text{Accounts payable}] \times 365 / \text{Sales}$, with the only difference being that we do not scale NWC according to days. While Deloof (2003) used CCC as the metric in his study of WCM in Belgian firms, he estimated the same regressions also using the net trade cycle, and confirmed that the results aligned.

6.3.2 Independent Variables

6.3.2.1 Financial Debt Ratio

The debt ratio chosen for this study is financial debt as a % of total assets, defined as:

$$\text{Financial debt}_t = \frac{\text{Interest bearing debt}_t}{\text{Total assets}_t} \quad (5)$$

This is the same definition as the one used by Deloof (2003). Alternative debt ratios used in other studies of working capital management (WCM) include total liabilities to total assets (Chiou et al. 2006; Nazir & Afza 2009), and long term debt to equity or total assets (Appuhami 2008; Palombini & Nakamura 2012). However, we argue that financial leverage ratio is preferable in isolation, as it excludes operating liabilities such as accounts payable which would otherwise imply a form of double counting when analyzing net working capital (NWC) in relation to debt. Moreover, we argue that financial debt with its interest bearing nature is a more appropriate metric with reference to the theory of agency costs of debt. Interest expenses derived from debt owed to credit institutions, such as banks, directly impose additional liquidity pressure compared to firms with more non-interest bearing / operational liabilities on the balance sheet. From this perspective, the incentives for management to reduce working capital to free up cash for the benefit of sustaining a high debt level may be of greater importance. Lastly, we deem financial leverage the more appropriate debt metric as we have chosen to focus on PE-backed firms in this study, and financial leverage is a common component to how PE-firms finance their portfolio investments to amplify equity returns (Berg & Gottschalg 2005).

6.3.3 Control Variables

Based on indications from previous research on determinants of working capital management (WCM), we have chosen to include a number of control variables.

The ratio of cash and cash equivalents to total assets is used to control for any impact cash holdings may have on the WCM of our studied sample. Since we do not include cash in our definition of NWC, it still is an inherent factor of business liquidity and may serve as an important indicator of how working capital is managed and subsequently what levels of debt a firm can sustain. Prior studies suggest that if a firm's working capital is managed efficiently, the need for large cash holdings is reduced (Fawzi & Shubita 2019) and that smaller firms tend to keep high levels of cash due to external financial constraints, while economies of scale enable large firms to keep lower levels of cash on their balance sheet (Gao et al. 2013).

According to Kieschnick et al. (2006), large companies have a competitive advantage with regards to WCM, such as having market power that improves ability to bargain with suppliers to decrease credit terms. Using the same definition as Deloof (2003), we choose to control for company size computed as the natural logarithm of sales.

Furthermore, future growth opportunities can impact WCM since different amounts of working capital are required to meet different levels of demand depending on anticipated growth. For example, future growth prospects may require a build-up of inventory (Kieschnick et al. 2006) which in effect implies that companies experiencing higher sales growth are expected to invest more in NWC. We measure sales growth as $[\text{this year's sales} / \text{previous year's sales}] - 1$, in line with the definition used in previous studies (Deloof 2003; Nazir & Afza 2008; Appuhami 2008; Palombini & Nakamura 2012).

Company age, defined as the difference between the acquisition year and the year of incorporation for each sample firm, is included as an additional control variable. Chiou et al. (2006) argue that older firms have better access to external financing, including trade credit relationships and general financing terms, which could explain that higher firm age is associated with higher working capital requirements. This relationship leads to older firms tending to invest more in working capital, while younger firms tend to use more credit from suppliers due to lower credit capacity and reputation (Baños-Caballero et al., 2012).

Moreover, we control for operating return on assets in our study, defined as EBITDA over total assets. In essence, the ratio indicates operating efficiency of utilized assets in its ability to generate value. Previous studies indicate a non-linear relationship between profitability and WCM (Baños-Caballero et al. 2012; Aktas et al., 2015). They suggest an expected positive relationship between WCM and profitability at low levels of working capital, but that the contrary may be true when levels are excessively high.

Previous studies also suggest that WCM in practice differs across industries (Shin & Soenen 1998; Kieschnick et al. 2006; Nazir & Afza 2009; Nakamura & Palombini 2012). As

such, we deem it important to control for industry effects that may have significant impacts on the general WCM observed across our sample firms. Similar to the industry classification made by Nakamura and Palombini (2012), we divided our firms into three main sectors: Industry (including manufacturing and industrial companies), Retail (including consumer retail and wholesale) and Other (including technology, media and telecom (TMT), services and all other sectors). The definitions were made with reference to the standard industry code according to the SNI³ industry classification system and industry definitions. In cases where the analyzed entity was a holding company, we referred to industry classification of the operating subsidiary, as did Bergström et al. (2007) when matching their buyout firms to industry peers.

6.4 Statistical Method and Regression Model

6.4.1 Average Change in Net Working Capital

To test whether a private equity (PE) buyout reduces working capital in the company, we use a two-tailed Student T-test to test the difference in each working capital metric as a percentage of sales (net working capital, inventory, accounts receivable and accounts payable) pre and post transaction. This is similar to Kaplan's (1989) approach where he used a Wilcoxon signed rank test to assess the effect of PE buyouts on operating metrics of portfolio companies. We instead employ the Student T-test, described by the following statistic.

$$t = \frac{\frac{\sum(WC/sales_{t+1} - WC/sales_t)}{N}}{\sqrt{\frac{\sum(WC/sales_{t+1} - WC/sales_t)^2 - \frac{(\sum(WC/sales_{t+1} - WC/sales_t))^2}{N}}{(N-1)N}}}$$

where WC is either net working capital, inventory, accounts receivable or accounts payable and N is the number of observations, 126.

The Student T-test assumes that the mean values of difference between pre and post buyouts follow a normal distribution. According to the central limit theorem, the means of samples approach a normal distribution given a large enough sample size (>30). As our data set contains 126>30 observations, we make the assumption of the T-test being applicable. Potential limitations to this assumption are further described in section 7.5 methodological limitations.

The above test is performed on three time periods, each starting at year -1 (one year prior to buyout) and ending one, two and three years, respectively, post transaction (y0, y1, y2).

³ The Swedish Standard Industrial Classification used to classify enterprises and workplaces according to the activity carried out.

6.4.2 Relationship between Financial Debt ratio and Net Working Capital

To test for a relationship between financial debt and working capital (WC), we regress net working capital (NWC) as a percentage of sales (as the dependent variable) to the financial debt to total assets ratio (as the independent variable). We include eight control variables (of which three are industry indicators) as described earlier. The regression is also performed on each component of net working capital, namely inventory, accounts receivable and accounts payable as percentages of sales. For the purpose of the regressions, our time series data beginning in year 0 (the point of the buyout) is turned into panel data. By treating each year for each company as a separate data point, thereby increasing the total number of data points by a factor of three. In instances where some data is missing for a particular company and year, the whole row is deleted from the sample, resulting in a total number of observations of 281, which is less than three times the original number of transactions (109). The regressions can be summarized by the following equation:

$$WC/sales_t = \beta_1 \times financial\ debt/assets_t + \beta_2 \times \ln(sales_t) + \beta_3 \times company\ age_t + \beta_4 \times cash/assets_t + \beta_5 \times growth_t + \beta_6 \times EBITDA/assets_t + \beta_7 \times industrial_t + \beta_8 \times retail_t + \beta_9 \times other_t$$

where WC/sales is either NWC/sales, inventory/sales, accounts receivable/sales or accounts payable/sales. After excluding outliers (data points in the top and bottom quartile) we arrive at 261 observations for regressing net working capital/sales, 269 for inventory/sales, 271 for receivable/sales and 265 for payables/sales.

7. RESULTS

7.1 Descriptive Statistics

7.1.1 T-test

Looking across descriptive statistics (table 2) for net working capital (NWC) and its components in relation to sales for the companies in our data set, we observe some extreme values but overall low deviation between median and mean values. For NWC/sales, data shows that buyouts in our sample are widely dispersed, with the metric in year 0 (buyout year) demonstrating observations between -181.3% to 284.1%. This is expected due to the construct of the metric as a ratio of sales, furthermore depending on a sum of its components also expressed as ratios of sales. We see from the sales figures that the sample is widely dispersed, ranging from less than 1 SEKm to more than 7 SEKbn in year 0. Consequently, in cases with very small firms (low sales), a slight change in absolute working capital levels can have

substantial impact on the ratio metric. Worth noting is that sales figures are influenced by add-on acquisitions and divestitures. However, the same is expected for working capital components, implying that the impact on the ratios would be relatively limited assuming the core operations remain at similar levels.

Table 2. Descriptive statistics for t-test data set

	Obs.	Mean	Median	St. dev.	Min	Max
<u>NWC/sales</u>						
y-1	126	0.152	0.124	0.149	-0.092	0.708
y0	126	0.124	0.115	0.335	-1.813	2.841
y1	126	0.120	0.117	0.121	-0.210	0.434
y2	126	0.119	0.114	0.112	-0.173	0.446
<u>Inventory/sales</u>						
y-1	126	0.088	0.038	0.113	0.000	0.540
y0	126	0.075	0.024	0.095	0.000	0.486
y1	126	0.073	0.022	0.096	0.000	0.477
y2	126	0.073	0.027	0.100	0.000	0.601
<u>Accounts receivable/sales</u>						
y-1	126	0.158	0.129	0.154	0.000	0.891
y0	126	0.152	0.120	0.274	0.000	3.015
y1	126	0.127	0.120	0.093	0.000	0.467
y2	126	0.119	0.120	0.085	0.000	0.433
<u>Accounts payable/sales</u>						
y-1	126	0.095	0.070	0.091	0.000	0.684
y0	126	0.104	0.068	0.230	0.000	2.377
y1	126	0.081	0.072	0.061	0.000	0.428
y2	126	0.073	0.062	0.053	0.000	0.393
<u>Sales (SEKm)</u>						
y-1	126	350.916	180.814	558.761	0.244	3659.000
y0	126	521.609	231.834	999.928	0.257	7075.623
y1	126	567.377	267.717	1057.108	3.797	8169.327
y2	126	610.894	315.556	1082.497	4.428	8885.226

Descriptive statistics for a sample of 126 PE-buyouts in Sweden that occurred between the second half of 2009 and first half of 2017. Year -1 reflects the year prior to when a firm was acquired, while year 0 is the first year in which the acquired company is considered fully owned by a PE-firm, and year 1 and 2 represent the two following financial years under PE ownership. Financial data from years 2009-2019.

In year y-1, one year prior to the private equity (PE) buyout, firms on average have a NWC/sales ratio of 15.2%, an inventory/sales ratio of 8.8%, an accounts receivable/sales ratio of 15.8% and an accounts payable/sales ratio of 9.5%. In year 0, the year during which a PE buyout occurs, firms on average have lower NWC/sales of 12.4%, lower inventory/sales of 7.5% and accounts receivable/sales of 15.2%, while a higher accounts payable/sales of 10.4%. This trend continues throughout year 1 and 2 (one and two years post transaction, respectively), with the exception of accounts payable/sales becoming gradually lower in year 1 and in year 2. Data are in line with hypotheses 1-3, stating that NWC, inventory and accounts receivable as percentages of sales should decline following a PE buyout. Hypothesis 4, stating that accounts payables should increase, is however not completely supported by the results, as the figure only increases

during year 0. For NWC/sales and inventory/sales, the largest year-over-year impact occurs during year 0 (as illustrated in appendix 3). For accounts receivable/sales and accounts payable/sales year 1 showed the largest shift. The forthcoming T-test will shed light on this, as we will investigate the statistical significance of change during different time periods.

7.1.2 Regression

Table 3. Descriptive statistics for regression data sets

Variables	Obs.	Mean	Median	St. dev.	Min	Max
NWC/sales	281	0.138	0.123	0.210	-1.165	2.841
Inventory/sales	281	0.084	0.044	0.102	0.000	0.601
Accounts receivable/sales	281	0.134	0.124	0.193	0.000	3.015
Accounts payable/sales	281	0.080	0.071	0.080	0.001	1.165
Financial debt/assets	281	0.233	0.212	0.184	0.000	1.504
ln(sales)	281	5.588	5.624	1.347	0.563	9.092
<i>Sales (SEKm, not incl. in model)</i>	<i>281</i>	<i>621.937</i>	<i>276.932</i>	<i>1,111.332</i>	<i>1.756</i>	<i>8,885.226</i>
Company age	281	26.107	18.000	30.152	0.000	115.000
Cash/assets	281	0.063	0.039	0.072	0.000	0.443
Growth	281	0.329	0.126	0.727	-0.523	5.495
EBITDA/assets	281	0.089	0.092	0.168	-1.256	1.178
Industrial (dummy)	281	0.306	0.000	0.462	0.000	1.000
Retail (dummy)	281	0.235	0.000	0.425	0.000	1.000
Other (dummy)	281	0.488	0.000	0.501	0.000	1.000

Descriptive statistics for panel data based on a sample of 109 Swedish buyout companies acquired between the second half of 2009 and first half of 2017. Only years under PE ownership are included, i.e. the last year prior to acquisition is excluded. The regressions performed later in the study exclude outliers. Thus, the above data does not reflect the final data set going into the regression analyses.

In general, the mean and median values demonstrated across variables for the sample observations are relatively aligned. Even though extreme values exist (such as a min and max value of NWC/sales of -116.5% and 284.1%, respectively), they are somewhat evenly distributed towards and lower and upper end, keeping the median and mean values relatively aligned. The sample shows a mean and median NWC/sales of 13.8% and 12.3%, respectively, while the corresponding values for accounts receivable are 13.4% and 12.4%, and accounts payable are 8.0% and 7.1%. The greatest dispersion in NWC components is observed in inventory/sales, showing a mean of 8.4% and median of 4.4%. This can be explained by the min and max values of the statistic, with the former being 0.0% and the latter 60.1%. As the mean value is almost twice as large as the median, extreme values must be skewed towards the upper end. Moreover, we observe financial debt to total assets having a mean of 23.3% and median of 21.2% across the panel data, with 0.0% and 150.4% as the observed minimum and maximum values. This indicates that the capital structure of the typical firm in the sample consists of financial debt of approximately one fifth and one quarter of total capital, while some firms have no financial debt and some have more than 100% of capital borrowed from credit institutions, implying negative shareholder's equity. This could be a result of accumulated

losses throughout several years. As depicted in appendix 1 we observe a negative correlation between the dependent variable (NWC/sales) and independent variable (financial debt/assets). The down sloping trendline implies that buyout firms with higher levels of financial debt tend to have less NWC in relation to sales. However, the data is highly dispersed, so it is not clear that the relationship is significant, which is what our regression analysis aims to test.

Across the board of control variables, we observe that the average firm is 26 years old at the point of acquisition, at a size of 5.6 measured as the natural logarithm of sales and around 621.9 in million SEK. Corresponding median values are 18 years and 5.6 ln sales and around 276.9 million SEK. Year over year growth in sales is 32.9% and 12.6% respectively for the mean and median firm-year, where the higher mean is likely impacted by the maximum observed value of 549.5% which is not entirely offset by the minimum observed value of -52.3%. Operating return on assets as measured by EBITDA/assets demonstrate 8.9% mean versus a 9.2% median, while mean and median cash to assets are 6.3% and 3.9%. Lastly, our industry indicator variables indicate the distribution of industries across the sample. A majority (48.8%) of observations are categorized as “other”, which includes technology, media and telecom (TMT), services, and other industries. Industrials constitute 30.6% and retail 23.5%.

7.2 Correlation between Independent Variables

Table 4. Pearson correlation matrix

Variables	Financial debt	ln(sales)	Company age	Cash/assets	Growth	EBITDA/assets	Industrial	Retail	Other
Financial debt	1.000								
ln(sales)	-0.140**	1.000							
Company age	-0.110*	0.130*	1.000						
Cash/assets	-0.110*	-0.070	-0.010	1.000					
Growth	0.000	0.100	0.040	0.060	1.000				
EBITDA/assets	-0.050	0.000	0.030	0.020	0.030	1.000			
Industrial	0.120*	0.030	0.100*	-0.140**	0.010	0.080	1.000		
Retail	-0.120*	0.190***	-0.010	0.010	-0.070	-0.030	-0.360***	1.000	
Other	0.000	-0.190***	-0.080	-0.150**	0.110*	-0.040	-0.51***	-0.550***	1.000

The table presents correlations between variables included in the regression model. If a value is close to zero it indicates low correlation. Significance levels (p-value): *** 1%, ** 5%, * 10%

Correlations between two variables above a value of 0.8 suggest there will be problems with multicollinearity. The strongest correlations are observed between industry dummies, namely -0.55 between “Other” and “Retail”, -0.51 between “Other” and “Industrial”, and -0.36 between “Industrial” and “Retail”. However, this is expected due to the nature of the industry dummies where each firm-observation is categorized to exactly one of the industry classifications (taking the value of 1), while being excluded from the other two industry dummies (taking the value 0), hence resulting in significant negative correlations. As these variables are included to isolate

for potential industry effects and not intended to capture inter-industry relationships, we deem the risk of problems with multicollinearity limited for the purpose of our model. Moreover, no correlations between other variables in our model exceed 0.3 which is preferable from a multicollinearity perspective. Although the matrix shows some other correlations being significant, these are relatively weak which indicates low risk of the model being subject to multicollinearity issues.

7.3 T-test

Table 5. Two-sided T-test results

Period (year j to i)	-1 to 0	-1 to 1	-1 to 2
NWC/sales	-2.792%	-3.139%*** (-0.347%)	-3.251%*** (-0.112%)
Inventory/sales	-1.265%**	-1.431%** (-0.166%)	-1.464%** (0.033%)
Receivables/sales	-0.618%	-3.083%*** (-2.465%)	-3.926%*** (0.843%)
Payables/sales	+0.909%	-1.375%* (-2.284%)	-2.139%*** (-0.764%)

Result from our t-test testing hypotheses H1-H4 regarding the impact of PE buyouts on levels of working capital. The percentage figures reflect the mean change in each working capital metric (in percentage points) from year -1 to 0, -1 to 1 and -1 to 2, respectively. Figures in parenthesis represent year-over-year mean change (in percentage points). Year -1 reflects the year prior to when a firm was acquired, while year 0 is the first year in which the acquired company is considered fully owned by a PE-firm, and year 1 and 2 represent the two following financial years under PE ownership. Significance levels: *** 1%, ** 5%, * 10%. Observations: 126

During the first year after a buyout (from year -1 to 0), our sample demonstrates *lower* mean NWC/sales by 2.79 percentage points (herefrom denoted as p.p). In the underlying components, we observe 1.27p.p *lower* mean inventory/sales, 0.62p.p *lower* mean accounts receivable/sales, and 0.91p.p *higher* mean accounts payable/sales. These results all support the expected direction (*lower/higher*) in changes to NWC and its components following buyouts as hypothesized in H1-H4, albeit with statistical significance (5% level) only for the reduction of inventory/sales in the first year. In the second year post buyout (year -1 to 1 in table 5), we find significant support for hypotheses H1-H3 stating that NWC, inventories and receivables have been reduced in the buyout firms. In this period our sample demonstrates 3.14p.p *lower* mean NWC/sales and 1.4p.p *lower* mean accounts receivable/sales compared to pre-buyout levels with 1% significance, in addition to 3.08p.p *lower* inventory/sales with 5% significance. However, during the same period data shows 1.38p.p significantly *lower* accounts payable, contradictory to hypothesis H4 which states that payables have increased after a buyout. Comparing pre- versus three year post-buyout levels of NWC and its components (year -1 to

2), results indicate a similar pattern as for year two (-1 to 1), with the only difference being a greater significance (1%) for the *decrease* in accounts payable/sales.

Overall, the largest reduction in NWC/sales and inventory/sales occurs in the first year (y0) for our sample of Swedish buyouts, although with lower significance compared to the other periods. The sequential change in these two metrics throughout the last two periods, indicated by the delta of the percentage point (-0.35p.p and -0.11p.p for net working capital/sales and -0.16p.p and -0.03p.p for inventory/sales), are much lower, indicating that the largest portion of improvement happens immediately upon acquisition. For accounts receivable/sales the sharpest decrease occurs in the second buyout year (shown in table 5 as the delta of -2.46p.p between year -1 and 1), indicating that improvement in this metric does not occur immediately. Lastly, accounts payable/sales only show improvement (increase) during the first year (comparing year -1 to 0), with sequential worsening (decrease) in the following two years (delta -2.29p.p for year two and -0.76p.p in year three).

7.4 Regression Analyses

Table 6. Multiple regression results

Dependent variable	(1) NWC/ sales	(2) Inventory/ sales	(3) Accounts receivable/ sales	(4) Accounts payable/ sales
<u>Independent variable</u>				
Financial debt/assets	-0.032	-0.008	-0.054	-0.018
<u>Control variables</u>				
In sales	-0.009*	0.000	0.003	0.004*
Age	0.000	0.000	0.000	0.000**
Cash/assets	-0.083	-0.118**	0.018	-0.049
Growth	-0.005	-0.006	-0.002	-0.000
EBITDA/assets	0.062*	-0.022	0.097***	-0.017
Industrial	0.046**	0.110***	-0.012	0.034***
Retail	0.076***	0.150***	-0.040***	0.036***
Other	0.104	0.236***	-0.082	0.046**
Observations	261	269	271	265
R-squared	0.069	0.372	0.140	0.062

Results from our regressions testing hypothesis H5-H8 regarding the relationship between financial debt and levels of net working capital. Regression (1) tests for NWC in relation to financial debt as well as all control variables, while regressions (2)-(4) test for each NWC component separately including all control variables. All regressions are performed on panel data of years under PE ownership, i.e. excluding the last year prior to acquisition. Significance levels: *** 1%, ** 5%, * 10%

Impact from debt on Working Capital Management

Our main hypothesis H4 stating that there is a negative relationship between a company's financial debt ratio and NWC/sales is not significantly supported by regression (1) presented in table 6. The negative sign is in line with expectations - indicating that higher levels of financial debt are associated with lower working capital - but the small magnitude of the coefficient (-0.032) together with the lack of statistical significance speak for a weak relationship.

Regression (2) and (3) provide some support to hypotheses H5-H6, stating that there is a negative relationship between financial debt and inventory/sales and accounts receivable/sales. The coefficients, -0.008 and -0.054, are low, implying that the impact of financial debt on inventory/sales and accounts receivable/sales is low among our sample firms. However, the negative sign of both coefficients are in line with expectations, although without statistical significance. Hypotheses H8, stating that there is a positive relationship between financial debt and accounts payable/sales is not supported by regression (4) as it shows a negative coefficient of -0.018. This would imply that financial debt is associated with lower levels of accounts payable, as opposed to hypothesis H8. However, the figure lacks significance and the small magnitude of the coefficient speaks for a weak relationship in our sample.

Impact from Control Variables

The results above show little impact on working capital from either firm size or firm age with magnitudes on the coefficients being close to zero for all regressions (1)-(4), with varying significance. The negative sign on the coefficient for ln sales in regression (1) indicates that larger firms tend to have lower net working capital/sales, with a significance on the 1% level.

Cash/assets ratio is found to be significantly and negatively correlated with inventory/sales for the sample firms at the 5% significance levels. In addition, we find negative (insignificant) relationships between cash and net working capital/sales. Both these results are in line with expectations as working capital otherwise ties up cash. Accounts receivable and payable contradict this though, as the former shows a positive sign and the latter a negative.

No significant impact from sales growth on working capital is found in our sample data. Surprisingly all coefficient signs are negative, implying that firms that have experienced higher growth tend to operate with lower net working capital. This contradicts our expectations, as firms with higher growth expectations usually build up inventory, for instance (Kieschnick et al. 2006). A possible reason behind this discrepancy is that our sample contains PE buyouts, usually characterized by stable business fundamentals and lower growth.

Regression (3) shows that EBITDA/assets is significantly and positively correlated with accounts receivables at the 1% level, indicating that for each percentage point increase in operating return on assets, receivables/sales are 10 percentage points higher. Also, regression (1) suggests that net working capital/sales is significantly impacted by EBITDA/asset on the 10% level. This is in line with previous research (Baños-Caballero et al. 2012; Aktas et al. 2015) that found that profitable companies often tie up more working capital.

Lastly, the industry effects highlight significant differences across the chosen groups, implying that the industry in which a firm operates is an important explanatory factor for differences in working capital. All three industry groups are significantly and positively correlated to inventory/sales at the 1% significance level. Furthermore, retail companies are shown to have a significant negative relationship with accounts payable at the 1% level, indicating that these firms tend to have less credit sale. On the other hand, the “other” category which comprises Technology, Media and Telecom (TMT), service companies and all other industries not classified according to the other industry groups, show an overall weaker correlation with NWC and its components, albeit with a positive relationship to inventory/sales at the 10% level.

7.5 Robustness Tests and Methodological Limitations

As described in section 6.1, we chose to assign buyouts taking place during the *second half* of a year with the same year as base year (i.e. the year prior to a change in ownership), while buyouts taking place in the *first half* of the year have been assigned the year prior to the buyout year as the base year. As many working capital initiatives are initiated immediately by the private equity (PE) firms (as shown in previous studies presented in section 4), the cut-off period may distort our data. For example, if two buyouts take place close to the cut-off point but on opposite sides of it, one company will be treated as non-PE-backed while the other will be treated as one for the given year, even though they have been owned by a PE firm for approximately the same amount of time. However, we view this potential risk of distortion to be low as our sample is large enough to include a wide spread of buyouts throughout the years (as illustrated in appendix 4).

There is a potential risk of bias in our sample of buyouts related to the time period chosen. The beginning of this period (2009) is right after the financial crisis, where macroeconomic factors caused financial and operational distress to firms globally. Consequently, buyouts that occurred closely after the crisis may have been abnormally underperforming, thus leaving greater room for short-term improvements in areas such as working capital management. However, as we have a large sample of buyouts spread out over the years between 2009 and 2017 (see appendix 4) we deem this risk to be low. We further mitigated this risk by excluding outliers.

Moreover, a prerequisite for the applicability of a T-test, used to test hypotheses H1-H4 in this study, is that the underlying data follows a normal distribution. If not, there is a risk of

skewness in the distribution that might affect the confidence intervals and hypothesis testing. As we have excluded outliers in our data set, however, we have limited potential problems related to this risk.

A main assumption underlying linear regression is the absence of heteroscedasticity, i.e. that the variance of the residuals of a regression model is constant across all values of the predicted variable. To test for this, we plotted residual versus fitted graphs to visualize this effect, and as shown in appendix 6, heteroscedasticity can be assumed to be absent, as the spread in residual versus fitted numbers appear to be rather constant. To solidify this conclusion, we also performed Breusch-Pagan tests for each regression, yielding the same conclusion for all regressions except inventory/sales (regression (2)). In other words, regression (2) shows signs of heteroscedasticity. Thus, any results from it must be analyzed with caution.

Additionally, there is an inherent risk of human error in the gathering of financial data, as the data provided by the databases had to be complemented by manual input. Nevertheless, we have minimized the potential error through cross-checking data between multiple databases and company filings.

8. ANALYSIS AND DISCUSSION

8.1 The Governing Role of Private Equity Ownership

To analyze the potential impacts of a change in ownership to private equity (PE) on a company's working capital management (WCM), we investigated the one-year prior versus three year post-buyout net working capital (NWC) on a sample of 126 PE-buyout transactions in the Swedish market between the second half of 2009 and first half of 2017.

Compared to pre-buyout levels, we find significant evidence for a reduction in the NWC/sales ratio by an average of 3.14p.p by year two and 3.25p.p by year three, confirming our main hypothesis that NWC/sales have been reduced in the buyout companies. This is largely in line with results of historical research on U.S. and U.K. buyouts (Easterwood et al. 1989; Kaplan 1989; Holthausen & Larcker 1998; Wright et al. 1992), and supports a notion of WCM initiatives still being an important part of PE-sponsors investment strategies by actively tighten the control of working capital in their portfolio companies. It also corroborates with more recent reports on PE-practices across Europe and U.S. (Siemes & Schouten 2017; Braghin et al. 2020), emphasizing that a change in ownership to PE is associated with an increased focus on WCM, with targets typically set and addressed early in the buyout process.

Furthermore, we find significant support for our second and third hypothesis stating that inventory and accounts receivable have been reduced in the buyout companies, consequent with the findings by Kaplan (1989) and Easterwood et al. (1989). In general, results of lower mean current assets compared to pre-buyout levels represent a narrowing of the buyout companies' net operational funding gap, suggesting that they on average become less reliant on external funding to run daily operations. It also demonstrates potential improvements in inventory management and more timely collection of customer payments, which could provide buyout companies with competitive advantages as proposed by Siemes and Schouten (2017). The largest portion of improvement in inventory/sales (-1.27p.p) is observed in the year immediately after the buyout, while we find only a low and non-significant reduction in accounts receivable/sales (-0.62p.p) in the same period, however followed by significant and larger reductions in year two (-3.08p.p) and three (-3.93p.p). This could be explained by a relative ease of execution to lower inventory levels, such as by selling off obsolete goods on a discount or making purchases-to-order to prevent stockpiling versus the more complex or time-consuming processes of collecting payments from insolvent customers or renegotiating longer receivables terms. While supporting the findings of Wright et al. (1992) that it is yet a common and important WCM initiative implemented by PE-firms in their buyout targets, this observed time lag on decreases to accounts receivable/sales ratio could relate to general complexity in buyout value creation which requires more time to realize (Castellaneta & Gottschalg 2016).

Furthermore, we find no significant support for our fourth hypothesis stating that accounts payable/sales have increased in the buyout firms. Although we observe an expected but non-significant increase of 0.91p.p in year one, data also show significantly lower mean ratios by the following two years, by -1.38p.p and -2.14p.p compared to pre-buyout levels. This suggests that PE-buyouts tend to slightly improve credit terms immediately after acquisition, but that shortening of debtor days seem to not be a key lever to improve overall WCM in our sample, contradicting historical buyout research (Wright et al. 1992) and more recent reports on PE-practices versus public peers (Siemes & Schouten 2017). A possible reason could relate to PE-firms focusing on growing their portfolio companies, thereby creating new supplier relationships, and accepting less favorable credit terms to better meet anticipated demand.

Viewing the results through agency theory (Jensen & Meckling 1976; Eisenhardt 1989), a reason explaining the observed reductions of NWC/sales in our sample could be that buyout managers experience increased monitoring from the point of acquisition. As described by Easterwood et al (1989), the change in ownership structure drives the firm's managers to adapt to the value-maximizing interests of a new, concentrated ownership base of private equity (PE)

investors. Due to the fact that our sample is delimited to buyouts where the PE stake is at least 50%, the target's company managers arguably become responsible to serve a small group of owners with an assumed interest in amplifying shareholder returns. Related to working capital management (WCM), this increased monitoring from a change in ownership to PE could prevent managers from pursuing excessive investments in working capital, such as extending credit terms to longstanding customers, keeping the same supplier although payment terms are below market standards, and maintaining inventories high to prevent stockouts. Similar to the (non-significant) findings by Nakamura and Palombini (2012) in listed Brazilian firms, our results support a notion that ownership concentration has a governing role with regards to improving WCM. Beyond ownership concentration however, significant evidence presented in our study of reduced net working capital (NWC) in buyouts suggests that ownership type provides additional explanatory power. This is in line with Holthausen and Larcker's study (1998) showing that post-LBO *increases* of working capital were associated with lower ownership concentration after the public offering, i.e. when the PE-sponsor exited its ownership of the firm. A change to PE ownership may also include a greater extent of outside board members compared to the pre-buyout firm, thus contributing to increased management monitoring and potentially improved WCM in line with findings by Kieschnick et al. (2006).

Another theoretical perspective to explain why the PE ownership *per se* could be of importance for the observed significant NWC reductions is the "parenting advantage", meaning characteristics deemed unique to PE versus other types of ownership that improves portfolio companies' performance that they could not have generated solely with their own resources (Berg & Gottschalg 2005; Bergström et al. 2007; Castellaneta & Gottschalg 2016). Related to WCM, PE firms may offer their buyout companies specialist expertise in supply chain management and provide strategic direction in how to expand a business with more efficient resource allocation while leveraging networks and industry experience to negotiate for better terms with customers and suppliers.

Consequent with prior research (Bergström et al. 2007; Guo et al. 2011), the economic interpretation behind our results also indicate that reduced NWC is a lever of value creation in our sample firms. Based on the average firm having SEK 512m in sales (average across all years, table 3), the observed ~3p.p less NWC/sales in one to three years (table 3) translates into around SEK 17m cash freed up from a buyout firm's working capital, which is non-negligible. In terms of amplifying financial returns, this freed up cash could be used to e.g. pay PE investors additional dividends or directly improve return on invested capital from having a lower capital base. On the other hand the freed up funds could be allocated more efficiently in the business,

such as investing in other more profitable and long term projects that ultimately generates more value versus when locked up in WC.

8.2 The Governing Role of Debt

To investigate the role of financial debt on working capital management (WCM) we studied a panel data set containing financials for 109 private equity (PE) buyouts in the Swedish market between the second half of 2009 and first half of 2017.

As presented in table 6 and regression (1), a negative relationship exists between financial debt/assets net working capital (NWC)/sales, in line with hypothesis H5 stating that such relationship exists. However, the finding is not statistically significant, and the magnitude of the coefficient (-0.032) is small. Thus, we cannot with certainty affirm the robustness of the hypothesis. In other words, our results imply that, according to our sample and linear model, a company with a higher financial debt/assets ratio tends to have a lower NWC/sales ratio, than a similar company with lower financial debt/assets. However, given the lack of statistical significance as elaborated on earlier, this conclusion cannot be assumed to hold in most cases.

These results are in line with the agency theory (Jensen 1986) – that a high amount of debt has the potential of improving a firm's capital efficiency, as the interest expenses related to the debt reduces disposable free cash flow, thus instilling a sense of pressure within the organization to not pursue wasteful spending. This could materialize through more efficient working capital management (i.e. a lower NWC/sales ratio), for instance, as it could unlock tied-up cash. The results also somewhat confirm previous findings. Nakamura and Palombini (2012), Nazir and Afza (2009), Chiou et al. (2006) and Mohamad et al. (2013) all found significant negative relationships between debt levels and NWC, in line with our findings. However, our lack of significance and low coefficients suggest that our sample behaved differently compared to the aforementioned studies' samples. A possible explanation for the discrepancy is the time period studied. The above studies used data from 1996 to 2008, during which interest rates were at much higher levels compared to the period between 2009 and 2017 that our study focused on. Thus, the financial expenses related to debt might not have been high enough to reduce disposable free cash flow to a level that actually alters managers' behavior (as it would according to the Jensen's agency theory (1986)). In this case, it would be no surprise to find a weak relationship between financial debt and NWC, as we did in our analysis. Another plausible reason our results differ from previous studies is the type of firms being investigated – our work focuses on private equity (PE) owned companies while previous studies looked at either the broader private market (not solely PE) or publicly listed firms. This provides some

indication that the ownership type matters when it comes to working capital management – in this case that financial debt in PE buyouts appear to be less important for the observed level of working capital than firms with other kinds of owners.

Our sixth and seventh hypotheses state that there is a negative relationship between financial debt and inventory level and between financial debt and accounts receivable, respectively. With the agency theory (Jensen 1986) as a guiding framework, we would expect higher financial debt to make managers more prone to free up cash, for example through reducing accounts receivable and inventory. As was the case with NWC/sales and hypothesis H5, our results support the hypotheses (see table 6 and regression (2) and (3)), albeit at a non-significant level and with an even smaller coefficient. Hence, we can not with confidence conclude of any negative relationships between debt and inventory and between debt and accounts receivable. Moreover, regression (2) showed signs of heteroscedasticity (see appendix 6), yielding the result from this regression unreliable.

Our eighth hypothesis, stating that there is a positive relationship between financial debt and accounts payable, is not supported by our findings, as our observed coefficient has a positive sign (table 6, regression (4)). This contradicts the agency theory (Jensen 1986), according to which managers would be inclined to increase accounts payable to gain cash that could be used to service debt. No significance is found, though, rendering us unable to draw any firm conclusions regarding debt and accounts payable among our sample firms.

As a final note, a reason behind our regressions' lack of significance compared to reviewed literature and studies could be the rather low debt level among our sample. As presented in table 3, the mean financial debt/assets ratio for our sample is 23.3%, whereas the debt level for a typical buyout historically has been between 60% and 90% (Kaplan & Strömberg 2009). This would be consistent with the trend that PE firms have somewhat shifted focus from financial engineering through debt to value-creation through operational improvements (Berg & Gottschalg 2005), leaving financial debt a less integral part of value-creation in buyouts of more recent time periods.

8.3 Governed by the Owner or Governed by Debt?

To evaluate the relative importance of ownership versus debt as the governor of private equity (PE) buyout companies working capital management (WCM), we need to put the observed effects from the T-test in relation to what our regression analysis indicates about the required debt level to reach the same impact on lower net working capital (NWC)/sales. Evidence

presented in the T-test supports that companies experience significant reductions in NWC/sales after a change in ownership to PE, corresponding to a 3.25p.p lower ratio in year three post buyout compared to pre-buyout levels. While the regression analysis shows no significant relationship between financial debt and levels of NWC for the sample, the coefficient of -0.032 implies that firms with X times more units of financial debt/assets tend to have lower NWC/sales by a factor of $X \cdot -0.032$. Thus, in order to achieve a reduction in NWC/sales of 3.25p.p, as observed from the change in ownership using the T-test, a firm needs to have a above 100p.p higher financial debt/assets ratio. This would imply that the sample firms would have to increase their financial debt/assets ratio to above 100% to reach the desired NWC/sales reduction, in turn implying a negative shareholder's equity number. Although theoretically possible through years of accumulated financial loss, we deem this unrealistic for a typical firm as the PE firms then would hold negative portions of the companies. The regression also implies that NWC/sales for a random firm in our sample would decrease by 0.007p.p, assuming the firm has a hypothetical financial debt/assets ratio of 0% pre PE buyout (year -1) that reaches 21.12% (sample median, only including years after PE buyout) post buyout. This implied reduction in NWC/sales is much smaller than our observed reductions presented in table 5.

While also statistically insignificant, the low magnitudinal effect found by our regression model provides weak explanatory strength for debt level contributing to the observed negative change in the sample buyouts' NWC. While one explanation could be the relatively low levels of debt among our sample compared to what has been found in historical buyout literature, the results support that PE ownership has a more important governing role on buyout companies WCM in more recent time periods. In the light of agency theory (Jensen 1986), our results seem to be more driven by PE-ownership as the principal imposing an increased level of monitoring of management to control working capital levels and hence reduce agency costs, while showing weak and non-significant support for debt having the same magnitudinal impact. Results suggest that a higher ownership concentration from the change in ownership structure translates into more scrutiny over management decisions, while the parenting effect from experienced PE-sponsors might provide portfolio companies with additional capabilities to improve WCM beyond pre-buyout levels. In conclusion, evidence presented herein resonates with the notion of WCM in buyouts to be governed by the owner, and less governed by debt.

9. SUGGESTIONS FOR FUTURE RESEARCH

The aim of the tests in our thesis was to examine whether Swedish private equity (PE) buyouts show significantly reduced net working capital (NWC)/sales compared to pre-buyout levels and

to evaluate the relative importance of ownership versus debt as governing factors. To provide more support for the ownership type's impact on NWC, it would be interesting to complement the study by comparing PE-backed firms with a control group of non-PE-backed firms to test for the "PE-firm" effect. This would require a control group of companies with similar debt profiles in order to isolate the ownership effect from the debt effect.

To gain deeper insight into the underlying drivers of PE ownership as a management monitoring mechanism (Easterwood et al. 1989) it would be of interest to break it down into potential underlying drivers, such as comparing buyouts with different PE-ownership stakes and investigate the impacts from level of management equity ownership, ratio of outside board members and executive compensation, as suggested by other studies of ownership effect on the working capital management of listed firms (Nakamura & Palombini 2012; Kieschnick et al. 2006).

Lastly, when investigating the impact of debt on NWC, it would be of value to investigate whether our conclusions hold in higher interest rate environments or in firms under financial distress. Since our study is delimited to a period excluding years directly after the financial crisis (2008) and Covid-crisis (2020), as well as during years under relatively low interest rate environments in Sweden, this suggestion could further add insight to agency theory (Jensen 1986; Eisenhardt 1989) in the importance of debt versus other factors that restrict management from wasteful spending such as excessive investments in working capital.

10. CONCLUSION

This study examines the impacts of ownership and financial debt on the working capital management (WCM) of private equity (PE) buyouts in the Swedish market, and explores whether potential reductions of working capital in buyouts are rather governed by the owner or governed by debt. To evaluate these questions, we gathered a main data sample of 134 Swedish buyouts between the second half of 2009 and first half of 2017. The impact of ownership was tested through a Student's T-test by analyzing the changes to the net working capital (NWC)/sales ratio for the first three buyout years compared to pre-buyout levels. We also included separate analyses of inventory, accounts receivable and accounts payable (all in relation to sales) to explore where a potential change in NWC is derived from. These tests were performed on a total sample of 126 buyouts. Moreover, we investigated the impact from financial debt on the aforementioned NWC metrics through multivariate regressions on a slightly redacted sample of 109 firms, using panel data of the first three years under PE ownership. We stated eight different hypotheses, in which the first four related to the impact of

PE-ownership (tested through the T-test), and the last four related to the impact of financial debt on metrics of NWC (tested through regression).

We found significant support for our first, second and third hypotheses stating that the ratios of NWC/sales, accounts receivable/sales and inventory/sales have been reduced in the buyout companies. Moreover, we found weak non-significant support for our last four hypotheses, stating that financial debt negatively influences NWC/sales, inventory/sales and accounts receivable/sales and positively impacts accounts payable/sales. Putting the two tests together, we concluded that PE ownership seems to have a stronger governing effect over buyouts' WCM than financial debt.

Our results complement previous studies within WCM in that we studied ownership impact from a change in ownership among Swedish PE buyouts in particular, rather than international buyouts. We also added debt as a potential factor explaining the change in NWC among PE transactions, essentially comparing the agency theory (Jensen 1986; Eisenhardt 1989) from a management monitoring perspective (Easterwood et al. 1989) and debt perspective. Previous research has also been performed primarily on buyouts during the late 1900s or early 2000s. Our paper thus adds value by applying the theories previously explored on more recent data.

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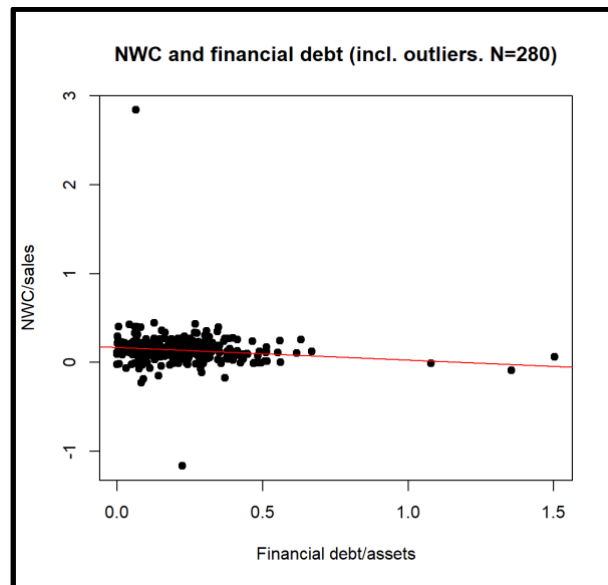
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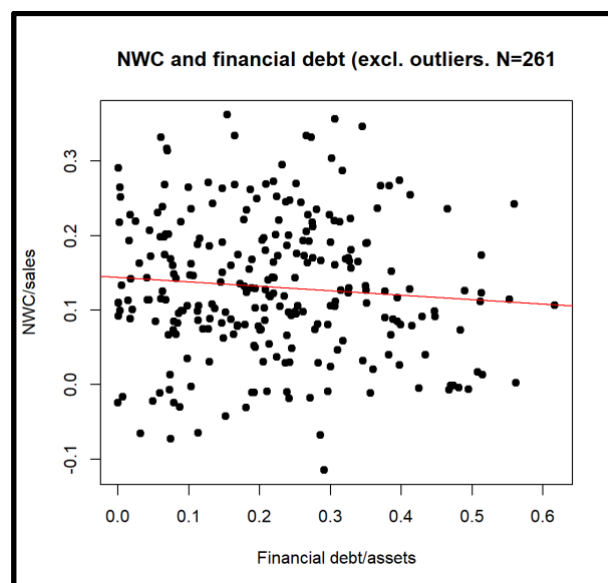
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APPENDIX

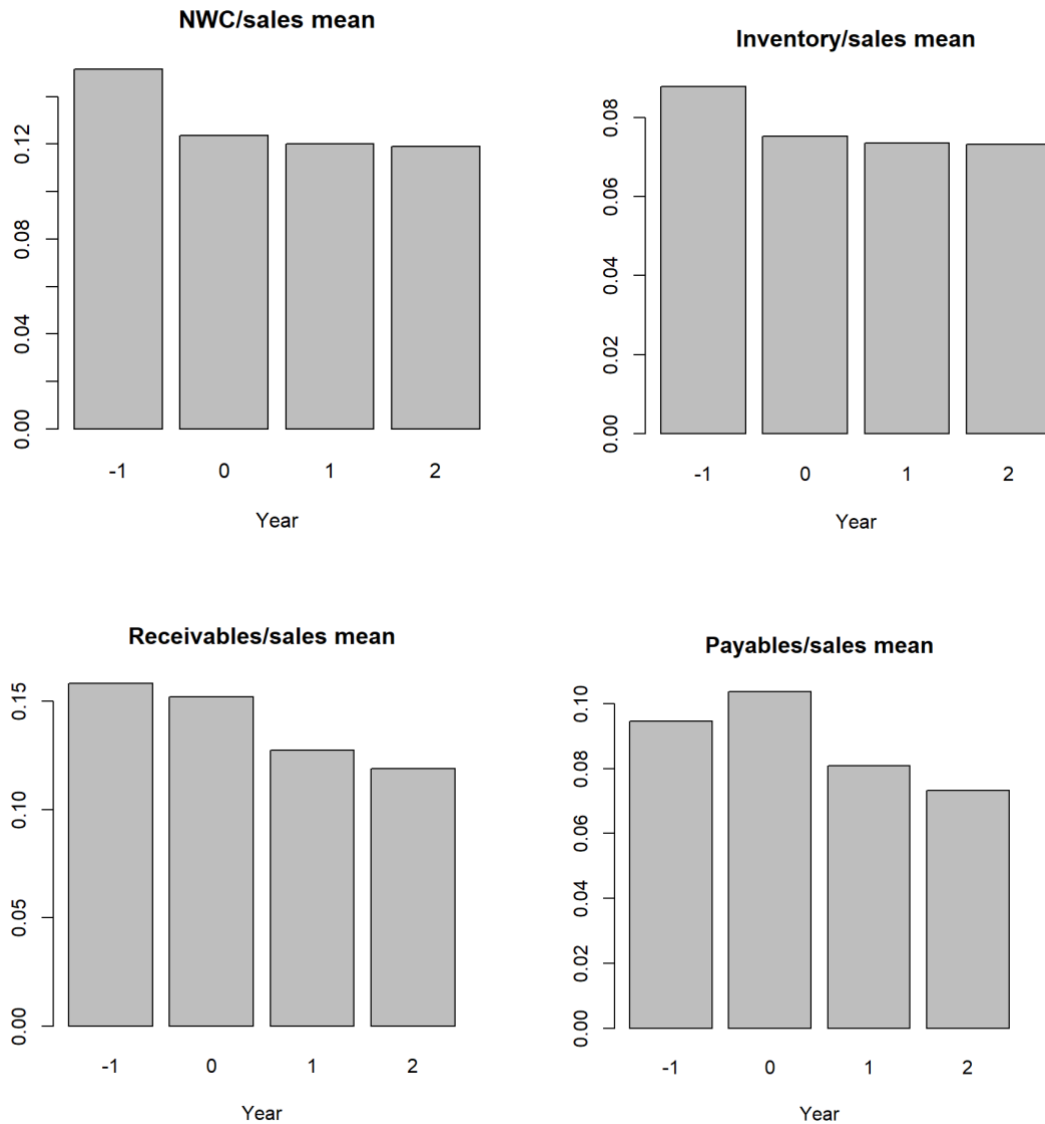
Appendix 1. Scatter-plot of panel data from 109 Swedish firms acquired by private equity between the second half of 2009 and first half of 2017. Data shows the relationship between net working capital (NWC)/sales (Y-axis) and financial debt/assets (X-axis). Each point represents one firm-year observation for an individual sample firm at any of the three years into the holding period (y0, y1, y2). In total, financial data spans from 2009-2019.



Appendix 2. Scatter-plot of the same data as in figure 1 but after exclusion of outliers (top and bottom quartile values).



Appendix 3. Illustration of change in net working capital and its components year over year, where year -1 is the last year prior to PE buyout and where year 0 is the first year under PE ownership.



Appendix 4. Overview of buyouts in sample per year of PE acquisition

Buyouts used in sample per year of acquisition							
2010	2011	2012	2013	2014	2015	2016	2017
13	33	14	12	13	9	23	17

Appendix 5. List of all PE buyouts included in the regression sample. Total of 134 buyouts.

PE buyouts included in sample

Company acquired by PE	PE firm	PE acquisition year	Included in regression	Included in T-test
Apotek Hjärtat AB	Altor	2010	x	x
Attendo Samsa AB	CapMan	2010	x	x
Bergteamet AB	Accent Equity	2010	x	x
Envirotainer Aktiebolag	AAC Capital Partners	2010	x	x
H.F. Oral Care Aktiebolag	Procuritas Capital Investors	2010	x	x
Karo Pharma Sverige AB	CapMan	2010	x	x
Kasthall Mattor och Golv AB	Karnell	2010	x	x
Scienta Scientific Aktiebolag	InnovationsKapital	2010	x	x
Swedegas AB	EQT	2010	x	x
Tactel Aktiebolag	FSN Capital	2010	x	x
Vindora Utbildning AB	FSN Capital	2010	x	x
Yrkesakademin AB	Fagerberg & Dellby	2010	x	x
Scanacon Aktiebolag	Capilon	2010		x
Akademikliniken HJ Aktiebolag	Polaris Private Equity	2011	x	x
AKWEL Sweden AB	Accent Equity	2011	x	x
Apsis International AB	Norvestor	2011	x	x
Aptilo Networks AB	Norvestor	2011	x	x
Aviator Airport Service Sweden AB	Accent Equity	2011	x	x
Bellbox Holding AB	Fidelio Capital	2011	x	
Big Bag AB	Fagerberg & Dellby	2011	x	x
Boråstapeter AB	Litorina Capital Advisors	2011	x	x
Episerver AB	Accel-KKR	2011	x	x
Grolls AB	Litorina Capital Advisors	2011	x	x
HL Display Aktiebolag	Ratos	2011	x	x
Hoist Group Holding AB	Accent Equity	2011	x	x
Karnov Group Holding AB	Five Arrows Principal Investments	2011	x	x
KVDbil AB	Ratos	2011	x	x
Maskinflisning i Laxå Aktiebolag	PEQ Invest	2011	x	x
Miroi AB	VIA Equity	2011	x	x
Munters Aktiebolag	Nordic Capital	2011	x	x
Nordomatic Aktiebolag	Sobro	2011	x	x
Noxon Aktiebolag	MVI Group	2011	x	x
One Nordic AB	Altor	2011	x	x
Ovako Sweden AB	Triton	2011	x	x
Perten Instruments Aktiebolag	Valedo Partners	2011	x	x
Polarica AB	Hartwall Capital	2011	x	x
Polygon AB	Triton	2011	x	x
Sanres Aktiebolag	PEQ Invest	2011	x	x
Scan Coin AB	Segulah	2011	x	x
Tengbongruppen Aktiebolag	Sobro	2011	x	x
Troax Group AB	FSN Capital Partners	2011	x	
Victor Hasselblad Aktiebolag	Ventizz Capital Fund	2011	x	x
Hööks Hästsport AB	Accent Equity Partners	2011		x
Iris Hadar AB	Fund K3	2011		x
Jernforsen Energi System AB	Alder Fund	2011		x
Nordic Waterproofing AB	Axcel Management	2011		x
Dynasafe International AB	Perusa Partners	2012	x	x
Eton AB	Litorina Capital Advisors	2012	x	x
ILT Group AB	PEQ Invest	2012	x	x
Jeeves Information Systems AB	Battery Ventures	2012	x	x
Llentab Group AB	Nordstjernan	2012	x	x
Miljörivarna in Scandinavia Group AB	Accent Equity Partners	2012	x	x
RCO Security AB	Novax	2012	x	x
Silva Sweden AB	Karnell	2012	x	x
Sortera Recycling AB	Norvestor	2012	x	x
STG Holding AB	Polaris Private Equity	2012	x	x
Swedish Education Group AB	The Riverside Company	2012	x	x
TPPG The Perimeter Protection Group AB	Procuritas Capital Investors	2012	x	x
Primär Service Management PSM AB	Sequent Invest	2012		x
Skånska Byggvaror Aktiebolag	Polaris Private Equity	2012		x
Aditro Logistics AB	Valedo Partners	2013	x	x
Ellos AB	Nordic Capital	2013	x	x
Internationella Engelska Skolan i Sverige AB	TA Associates Management	2013	x	x
J.G Ventilation Aktiebolag	Evolver Investment Group	2013	x	x
Kung Markatta Aktiebolag	Priveq Investment	2013	x	x
NeTel AB	Axcel Management	2013	x	x
OCAI Sverige II AB	Litorina Capital Advisors	2013	x	x
SEM Aktiebolag	Procuritas Capital Investors	2013	x	x

System Edström Bilinredningar AB	Nordic Industry Development	2013	x	x
Byredo AB	Manzanita Capital	2013		x
Cambio Healthcare Systems AB	Valedo Partners	2013		x
Picadeli AB	Fidelio Capital	2013		x
BrandFactory Holding AB	Accent Equity	2014	x	x
Breas Medical Aktiebolag	PBM Capital Group	2014	x	x
Brenderup AB	Accent Equity Partners	2014	x	x
Didriksons Regnkläder AB	Herkules Capital	2014	x	x
Falbygden Energi Nät AB	Infracapital Partners	2014	x	x
Iver Väst AB	Sobro	2014	x	x
Kjell & Co Elektronik AB	FSN Capital Partners	2014	x	x
Malte Månson Holding AB	CapMan	2014	x	x
Powerbox International Aktiebolag	Alder	2014	x	x
Ramudden AB	IK Partners	2014	x	x
Scanhold AB	Priveq Investment	2014	x	x
Synsam Group AB	CVC Capital Partners Limited	2014	x	
Synsam Group Sweden AB	CVC Capital Partners	2014		x
Cervera Group AB	Accent Equity	2015	x	x
Fyndiq AB	Northzone Ventures	2015	x	x
Gina Tricot AB	Nordic Capital	2015	x	x
Leo's AB	Litorina	2015	x	x
Lokaltidningen Mitt i Direkt AB	Segulah	2015	x	x
Rapid Images AB	Arctos Equity Partner	2015	x	x
Rapunzel of Sweden Holding AB	Valedo Partners	2015	x	
SMPP Holding AB	MVI Group	2015	x	x
S:t Eriks AB	Accent Equity	2015		x
Assemblin Holding AB	Triton	2016	x	x
Bogfelts Installationer och Entreprenad AB	Accent Equity	2016	x	x
Cint AB	Nordic Capital	2016	x	x
Danfo Holding Aktiebolag	Priveq Investment	2016	x	x
Fresks Försäljning AB	Litorina Capital Advisors	2016	x	x
Genesis Sweden AB	Accent Equity	2016	x	x
Intersport Sverige Holding AB	Adelis Equity Partners	2016	x	x
KungSängen Group AB	Litorina Capital Advisors	2016	x	x
OpenSolution Nordic Group Holding AB	IK Partners	2016	x	
POC Sweden AB	Investcorp	2016	x	x
RugVista Group AB (publ)	Litorina Capital Advisors	2016	x	
Sandbäcken Utveckling Aktiebolag	Segulah	2016	x	x
Silver Weibull Sweden Aktiebolag	Small Cap Partners	2016	x	x
Speed Group Holding AB	Ratos	2016	x	
Velcora Holding AB	FSN Capital	2016	x	x
Viametrics AB	Ceder Capital	2016	x	x
Bokhandelsgruppen i Sverige AB	Accent Equity	2016		x
Hermes Medical Solutions Aktiebolag	Segulah	2016		x
Mapillary AB	Atomico	2016		x
Ports Group AB	Priveq Investment	2016		x
Välinge Innovation AB	KKR	2016		x
Zengun AB	Segulah	2016		x
Zington AB	Sobro	2016		x
4C Group AB	Priveq Investment	2017	x	x
BRP Systems AB	Valedo Partners	2017	x	x
Caybon Holding AB	Priveq Investment	2017	x	x
Fractal Gaming AB	Litorina Capital Advisors	2017	x	x
Happy Plugs AB	Scope Capital Advisory	2017	x	x
Maintrac AB	Sobro	2017	x	x
Nordentic AB	Adelis Equity Partners	2017	x	x
Pagero AB	Summa Equity	2017	x	x
Parken Zoo i Eskilstuna Aktiebolag	Mimir Invest	2017	x	x
Rope Access Group Sverige AB	Sequent Invest	2017	x	
Somma AB	Pamica Group	2017	x	x
Desenio AB	Verdane	2017		x
Hemnet AB	General Atlantic Service Company	2017		x
Origo Group Sverige AB	Valedo Partners	2017		x
Reason Studios Aktiebolag	Verdane	2017		x
Safe Solutions Consulting i Sverige AB	Pamica Group	2017		x
Vitamin Well AB	Bridgepoint Development Capital	2017		x

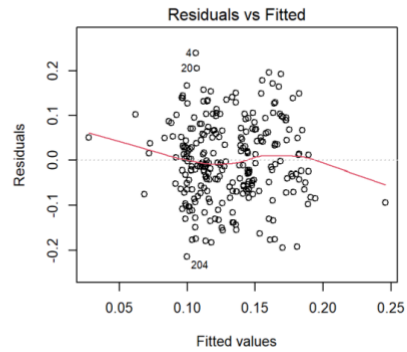
Appendix 6. Residual versus fitted analysis to check for heteroscedasticity in regressions

Heteroscedasticity test - Regression (1) NWC/sales

Breusch-Pagan test	Value
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Chisquare	0.351
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P-value	0.553
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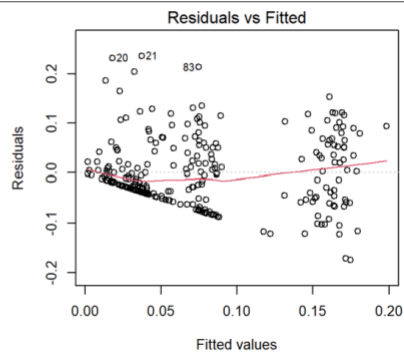


Heteroscedasticity test - Regression (2) Inventory/sales

Breusch-Pagan test	Value
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Chisquare	11.548
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P-value	0.001
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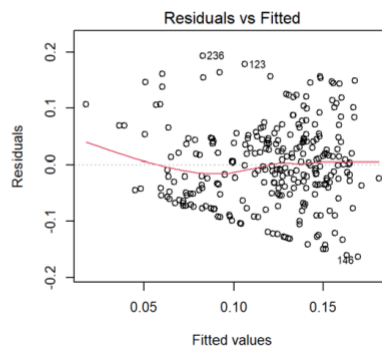


Heteroscedasticity test - Regression (3) Accounts receivable/sales

Breusch-Pagan test	Value
--------------------	-------

Chisquare	0.377
-----------	-------

P-value	0.539
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Heteroscedasticity test - Regression (4) Accounts payable/sales

Breusch-Pagan test	Value
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Chisquare	0.025
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P-value	0.875
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