Public to Private Transactions

An Empirical Study on Firm Performance in the Swedish Market

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Abstract

The landscape of corporate ownership structure has undergone a transformation through public-to-private (PTP) transactions. This thesis examines the financial impacts of such transactions within the Swedish market, utilising a dataset from the Serrano Database with transactions between 1999 and 2016. It employs Propensity Score Matching (PSM) to compare PTP firms with public counterparts, alongside a Difference-in-Differences (DiD) approach to evaluate long-term financial outcomes and the Wilcoxon Signed-Rank Test to assess changes within PTP firms. Our findings reveal that PTP transactions lead to significant declines in the financial health of firms; however, these declines are not significant when compared to the financial health observed in public counterparts. Within PTP firms, free cash flow management showed no improvements; in contrast, the Net Cash Flow to Sales Ratio declined compared to public firms. In terms of operating efficiency, no significant change was observed within PTP firms; however, the EBIT Margin decreased relative to public firms. Nonetheless, Asset Turnover for PTP firms increased compared to public counterparts, indicating more efficient use of assets to generate sales. Employee Efficiency improved within PTP firms with higher productivity and stable workforce growth. Compared to public counterparts, PTP transactions positively affected productivity and employee growth. Lastly, PTP transactions did not significantly affect the debt-to-equity ratio within firms, nor compared to public counterparts. The findings demonstrate that PTP transactions do not consistently outperform public entities in financial metrics, providing empirical evidence of their nuanced effects and underscoring the complex interplay between corporate strategies, operational efficiencies, and governance structures.

Keywords: Public to Private Transactions, Altman Z-score, Financial Performance, Stockholm Stock Exchange, Propensity Score Matching

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Definitions

These definitions are intended to eliminate ambiguity and provide a solid understanding of the concepts fundamental to our analysis of public-to-private transactions in the Swedish market.

- **Public-to-private transactions (PTP)** occur when a publicly listed company becomes privately owned, resulting in the delisting of its shares from public stock exchanges. This transition can be facilitated through buyouts, acquisitions, or management-led purchases.
- **Leveraged Buyouts (LBOs):** A financial transaction where a company's existing shares are purchased using a significant amount of borrowed money (leverage) to meet the acquisition cost. The assets of the company being acquired are often used as collateral for the loans in addition to the acquiring company's assets.
- **Management Buyouts (MBOs)** are a form of acquisition in which a company's existing managers acquire a significant part or all of the company from the current owners. MBOs are often financed through personal funds from the managers and debt financing.
- **Reverse Leveraged Buyouts (RLBOs):** The process of returning a company to publicly traded status after privatising it through a leveraged buyout.
- **Propensity Score Matching (PSM):** A statistical matching technique that attempts to estimate the effect of a treatment by accounting for the covariates that predict receiving the treatment.

1. Introduction

The transition from public to private ownership represents a significant strategic move for many firms, driven by various financial considerations. This transformation is not merely a financial reconfiguration but potentially reshapes a firm's long-term financial trajectory. Despite the frequent occurrence of such transactions, particularly from the late 20th century onward, their financial implications remain underexplored in contemporary research. This study aims to fill this gap by providing a detailed analysis of the financial impacts of PTP transactions within the Swedish market.

The motivations behind a firm's decision to delist and revert from public to private ownership often involve complex financial considerations. Such considerations typically include reducing public market compliance burdens, optimising financial operations away from constant shareholder scrutiny, and seizing restructuring opportunities to enhance shareholder value more effectively in a private setting. The consequences of such transactions extend beyond the firms themselves, impacting shareholders, employees, creditors, and the broader financial landscape. Understanding these comprehensive effects provides valuable insights into firms' financial health and stability.

The Swedish market offers a unique backdrop for this study due to its availability of financial information for private companies. Utilising the Swedish House of Finance's Serrano Database, which includes detailed financial histories of publicly listed and privately held companies, this thesis examines PTP transactions between 1999 and 2016. It employs PSM to create a control group of public companies, ensuring comparability regarding industry, size, and financial health. Additionally, a DiD regression analysis is used to isolate the effects of privatisation from other economic and financial trends, facilitating an examination of the financial changes during and after delisting. The Wilcoxon Signed-Rank Test is also applied to assess changes within PTP firms, capturing shifts in financial metrics over time.

This study finds that PTP transactions yield mixed financial outcomes. Although PTP firms experience improved financial health, these gains do not surpass those of public firms. Free cash flow management shows no overall improvement, with the Net Cash Flow to Sales Ratio declining compared to public firms. Operating efficiency within PTP firms also shows varied results. While no significant change in EBIT margin is observed, PTP firms demonstrate increased asset turnover compared to their public counterparts, indicating more efficient use of

assets to generate sales. Employee efficiency improves within PTP firms, with higher productivity and stable workforce growth. Compared to public firms, PTP entities show a positive effect on productivity but a negative effect on employee growth, suggesting deliberate optimisation. Finally, PTP transactions do not significantly affect the Debt-to-equity ratio, nor are they comparable to public firms, indicating anticipated leverage-related tax benefits are unrealised. The findings highlight the nuanced outcomes of PTP transactions, demonstrating that they do not uniformly outperform or underperform public firms. This underscores the complex interplay between corporate strategies, operational efficiencies, and governance structures, contributing to a broader understanding of PTP transactions and their financial impacts.

2. Background

To understand why firms revert to private ownership, it is crucial to first comprehend the motivations and strategic considerations for going public. This chapter provides an overview of influential theories that represent the major prevailing perspectives within the field. It details the financial, strategic, and operational factors that compel companies to go public and how these elements influence their decisions to go private again in a PTP transaction.

2.1. Going Public

The transition from private to public ownership, colloquially known as "going public," has been a transformative event in the corporate world for centuries. Through an Initial Public Offering (IPO), companies open their ownership to public investors, marking a significant milestone in their journey. This decision involves a multifaceted blend of financial, strategic, and operational considerations, influenced by various strategic factors rather than being dictated by a singular rationale or predetermined timing. The evaluation encompasses a spectrum of trade-offs, from the benefits of diversification and equity capital acquisition to the inherent disadvantages associated with the costs of becoming public.

Academic literature frequently references a range of conventional costs and benefits associated with this process. Pagano (1993) outlines the financial costs associated with a company's transition to public status, including registration and underwriting fees, the economic impact of underpricing shares, ongoing costs related to annual disclosures, and the principal-agent conflict emerging from a misalignment between ownership and management. Conversely, the benefits identified encompass diversification, the opportunity for equity financing that surpasses the initial entrepreneur's financial capacity, more affordable access to capital markets, enhanced liquidity of the company's shares, and the advantage of external monitoring.

Another perspective on why firms decide to go public relates to their position within their life cycle. Black and Gilson (1998) propose that IPOs serve as critical strategic milestones, facilitating a shift that allows entrepreneurs to regain control from venture capitalists at the point of their exit. This transition realigns the company's strategic direction with its original entrepreneurial intentions, highlighting that many IPOs represent a point of exit for venture

capitalists rather than for the entrepreneurs themselves. Chemmanur and Fulghieri (1999) present a view that resonates with the conventional wisdom surrounding IPOs, highlighting the role of IPOs in enabling a wider dispersion of ownership. In the stages leading up to an IPO, investors, particularly those involved in the early funding stages, often have portfolios lacking in diversification. This lack of diversification can lead to a hesitancy to value the company's shares as highly as more diversified investors in the public market might, given their ability to mitigate risk across a broader range of investments. This suggests that while a company may initially flourish in a private setting, supported by early investors who are prepared to accept higher risks for the possibility of higher returns, there comes a point in its growth where the advantages of entering the public market, with access to a broader and more diversified investor base, surpass the initial challenges associated with going public. Therefore, transitioning to a public entity is strategically aligned with the firm's developmental trajectory and its stage within the life cycle, marking a deliberate step in its evolution.

Lucas and McDonald (1990) introduce a model predicated on asymmetric information, proposing that firms are likely to defer their equity issuance when they perceive themselves to be undervalued. This insight hinges on the understanding that entrepreneurs, armed with superior knowledge about their firm's intrinsic value, opt to wait for a more opportune market climate. Specifically, if a bear market undervalues the firm based on the entrepreneurs' insights, the preference shifts towards postponing the IPO until a bull market prevails, ensuring more favourable valuation and pricing conditions. Complementing this perspective, Choe, Masulis, and Nanda (1993) further refine the strategic calculus of timing IPOs by examining the market's issuance climate. They find that firms strategically avoid periods characterised by a scarcity of other high-quality firms going public. This avoidance strategy is rooted in the belief that the presence (or absence) of other attractive IPOs can significantly influence investor perception and appetite, potentially affecting the valuation and success of their public offering.

In addition to financial considerations, companies have significant non-financial motivations to go public. Zingales (1995) emphasises the enhanced visibility and attractiveness to potential acquirers that public companies gain, which could potentially increase their market valuation in a takeover. Nevertheless, the relevance of these non-financial motives is subject to debate. Ritter and Welch (2002) argue that, for most firms, the predominant motivation remains the aspiration to raise equity capital and establish a public market, thereby enabling founders and shareholders to liquidate a portion of their holdings into cash later. They contend that non-financial factors, such as heightened publicity, generally play a secondary role in the decision to go public. Maksimovic and Pichler (2001) underscore that while achieving a high

public valuation can invite increased competition within the product market, the act of public trading itself harbours intrinsic value for the firm. This value emanates from financial metrics and the enhanced confidence and trust that public trading instils among a broader stakeholder group, including potential investors, customers, creditors, and suppliers. The visibility and perceived stability associated with being a publicly traded entity can foster stronger relationships with these key groups, thereby indirectly contributing to the firm's value beyond immediate financial gains.

2.2. Going Private

Before the 1980s, ascending to the status of a publicly listed company was widely regarded as a natural milestone in a corporation's growth trajectory. However, the 1980s challenged this traditional view, as the United States witnessed a marked shift towards private ownership among prominent and established firms. This movement underscored the realisation that transitioning to public listing was not an unequivocal step in corporate development. Amidst an era of economic expansion and a strong bull market, the United States saw its global market capitalisation share decline from 53.3% to 29.9% (Zingales, 1995), signalling a period of significant transformation within capital markets. This era, characterised by a substantial increase in the total market value of equity in publicly held companies and a rise in the frequency and size of going private transactions, particularly leveraged buyouts, substantially reshaped the industrial landscape. Such developments prompted a sophisticated reassessment of corporate finance strategies, taking into account the broader financial, economic, and regulatory milieu (Jensen, 1989).

Jensen (1989) articulates persuasive arguments that privatisation remedies several intrinsic shortcomings in public corporations, especially the discord between ownership and management over the stewardship of corporate assets. Entities that transitioned to private ownership showcased notable enhancements in operational efficiency, workforce productivity, and value for shareholders. The shift away from a public, corporate structure was pronounced across various industries, influenced by unique sector-specific dynamics, yet its pervasive decline led to remarkable gains in productivity. Public corporations were deemed less compatible in environments experiencing sluggish long-term growth, where the accumulation of internal capital outstripped opportunities for profitable investment, or in scenarios where strategic downsizing constituted the optimal long-term strategy. Sectors such as steel, chemicals,

brewing, tobacco, broadcasting, and wood and paper products illustrate areas where the public corporate model has significantly waned. In these industries, abundant in capital but limited in growth prospects, the drive for management to allocate cash flow towards unproductive organisational practices or unwise investments was profoundly compelling. In these scenarios, the inherent flaw of the public corporation, the divergence between the interests of shareholders and the investment decisions made by managers regarding the allocation of free cash flow, emerges as a critical source of inefficiency.

The post-1980 era witnessed notable advancements in corporate governance, including shifts towards tying managerial compensation more closely with performance. Despite these improvements to enhance transparency and accountability, Mehran and Peristiani (2010) investigate the persistent trend of firms going private, highlighted by a resurgence in Leveraged Buyouts (LBOs) and other privatisation transactions. They identify a crucial challenge for newer firms in achieving financial visibility sufficient to draw investor interest amidst ongoing agency problems and information asymmetries. Their study examines the free cash flow hypothesis by Jensen (1986), which suggests a managerial tendency to invest undistributed funds in negative net-present-value projects, indicative of a broader issue of resource misallocation. The researchers use the aggregate capital expenditures and market-to-book ratios as proxies to analyse investment decisions and growth potential. They find that firms with larger undistributed cash flows and lower growth prospects are more inclined to go private, also considering the impact of financial leverage and tax benefits. Their analysis provides critical insights into the complex motivations behind the privatisation trend against the backdrop of the 1990s' governance improvements.

Bharath and Dittmar (2010) offer additional perspectives on the motivations behind privatisation. Their research, focusing on going private transactions in the US from 1980 to 2004, investigates the factors influencing firms' decisions to transition from public to private entities. They identify that the propensity for privatisation is significantly influenced by the costliness of producing information for public markets and the extent of available public information about the firm. Their findings suggest that firms with less analyst coverage, lower institutional ownership, more concentrated ownership, and less liquidity are likelier to go private. This trend is particularly pronounced in firms with high levels of free cash flow in the 1980s, although it shifts over time. Bharath and Dittmar also note that firms facing financial constraints are more inclined to remain public, underscoring the critical role of access to capital in these decisions. Furthermore, they observe that firms that eventually go private tend to engage in fewer acquisitions throughout their public life, highlighting control considerations in

choosing between public and private status. The study also delineates the differences in privatisation drivers among firms taken private by private equity, management buyouts, and private operating companies, indicating that while certain motivations are universal, factors such as leverage and R&D expenses have subgroup-specific impacts.

Expanding on these findings, Bharath and Dittmar delve into additional theoretical frameworks, exploring the hypothesis that minimising the cost of capital to maximise company value is a significant motive for maintaining a public status. Originating from the seminal works of Modigliani and Miller (1963) and Scott (1976), this argument suggests that the incentive to stay public grows with the differential in capital costs between public and private markets. Additionally, the study considers agency considerations as a compelling motive for privatisation, as supported by Lehn and Poulsen (1989). By using proxies like free cash flow to assets, firm leverage, cash to assets, and asset tangibility, Bharath and Dittmar empirically explore these considerations, which also resonate with the need for capital, highlighting the nuanced interplay between access to capital and agency dynamics in driving privatisation decisions.

In a complementary analysis, Boot et al. (2008) explore the strategic considerations that influence a firm's decision to go private. They argue that while public ownership provides advantages such as increased liquidity and reduced capital costs, it also increases shareholder composition volatility. This volatility can lead to heightened friction between shareholders and management, presenting a critical challenge in the governance of public firms. According to their research, the Sarbanes-Oxley Act[1] has played a significant role in shaping these dynamics by increasing the costs associated with being public, thereby discouraging public ownership. They further note that firms transitioning from public to private ownership often experience an increase in value, underscoring the impact of investor participation in equity markets on a firm's ownership structure decision. The stability of a firm’s investor base, which varies significantly between private and public markets, emerges as a key factor in this strategic calculus, fundamentally influencing a firm’s preference for public or private ownership.

The shift from public to private ownership since the 1980s emerges as a strategic response to the inefficiencies of public markets. This transition, driven by economic conditions and regulatory changes, represents a move towards more efficient governance that better aligns with shareholder value. The research underscores the importance of adaptability in corporate

[1] The Sarbanes-Oxley Act (2002) is a U.S. law established to increase financial transparency and combat corporate fraud in publicly traded companies, introducing stricter regulatory requirements for corporate governance and financial reporting.

strategies, highlighting that effective governance requires a tailored approach in an ever-evolving business landscape.

3. Literature Review

To lay the groundwork for our study, we explore fundamental research that has shaped the discourse on PTP transactions. We begin with Jensen's 1986 analysis of the economic rationale behind LBOs and extend through Kaplan's insights into MBOs from the late 1980s and early 1990s. Recent studies by Guo et al. (2011) and the nuanced perspectives of Gill and Visnjic (2015) on governance, as well as Weir's (2013) examination of financial health in UK firms, also contribute to our review.

Our literature review covers a broad range of buyouts, including LBOs, RLBOs, and MBOs, providing a comprehensive view of their impact across different markets. By integrating these studies, we aim to bridge foundational theories with recent empirical findings, enhancing understanding of PTP's long-term effects on firm performance and financial health.

3.1. Early Research

Jensen's 1986 article, "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," offers a foundational perspective on the economic dynamics underlying PTP transactions. By elucidating the control function of debt, Jensen presents a compelling argument for why privatisation, primarily through LBOs, can significantly mitigate the agency costs associated with free cash flow. This insight is pivotal in understanding how the structural shift from public to private ownership addresses the inefficiencies arising from the separation of ownership and control in publicly traded companies. Jensen posits that the stringent financial discipline imposed by debt obligations in LBOs, coupled with the alignment of management incentives with increased equity stakes, not only enhances organisational efficiency but also creates a new organisational form that competes favourably against the conventional open corporate form. His work lays a crucial theoretical foundation for examining the motives and outcomes of firms transitioning from public to private ownership, setting the stage for a deeper exploration of these processes in various contexts, including the Swedish market, as explored in this thesis.

Building upon Jensen's insights into the efficiencies driven by debt mechanisms in LBOs, Kaplan (1989a) provides empirical evidence to further illuminate the operational impacts of such transactions on firm performance. Through an examination of 76 large MBOs of public companies between 1980 and 1986 in the United States, Kaplan's study, "The Effects of Management Buyouts on Operating Performance and Value," highlights that in the three years

following a buyout, companies witnessed increases in operating income, reductions in capital expenditures, and increases in net cash flow. Operating income relative to assets and sales exceeded industry changes by 20%, and the median net cash flow showed substantial increases in the first three years (22%, 43,1% and 80,5%) compared to the last pre-buyout year. The net cash flow ratios to assets and sales for the buyout companies exceeded industry changes by approximately 50%.

Kaplan also scrutinised the employee-wealth-transfer hypothesis proposed by Shleifer and Summers (1988), which suggests that investors gain wealth at employees' expense through wage reductions or layoffs. His findings revealed that within his sample, median employment changes were negligible. Employment even saw a median increase of 4.9% in cases without significant post-buyout divestitures. Nonetheless, these buyout companies experienced a 12% slower employment growth than their industry counterparts (a difference significant at the 1% level). This discrepancy might imply that a transfer of wealth from employees to investors does occur, albeit in a more nuanced manner than initially suggested.

Another critical aspect to observe is that MBOs might exhibit a tendency towards higher personnel retention, compared to other forms of public-to-private transactions, due to the unique position of the buyers, who are often from the company's existing management and staff. This insider status potentially fosters a focus on the company's long-term success, including prioritising workforce stability. As a result, MBOs may be less inclined to reduce workforce size for short-term financial gains. Given these considerations, extending our analysis across a broader spectrum of PTP transactions becomes particularly intriguing to investigate.

In a related work, "Management Buyouts: Evidence on Taxes as a Source of Value" using the same sample, Kaplan (1989b) elucidates the critical role of tax benefits as a significant source of wealth gains in management buyouts. The study estimates the median value of tax benefits to range from a lower bound of 21% to an upper bound of 143% of the premium paid to pre-buyout shareholders, underscoring the substantial impact of tax advantages on the value generated from MBOs. Key sources of these benefits included large interest deductions stemming from the substantial debt financing typical of MBOs and strategic uses of operating loss carryforwards post-buyout.

Complementing Kaplan’s findings, Smith (1990) discerns the subtleties of operational performance post-buyout, introducing working capital and liquidity as critical dimensions of financial health. Smith presents a comparative analysis from 1977 to 1986, with a sample of 58 management buyouts. Like Kaplan's investigation, the study utilises a broader temporal lens.

The focus on operating performance reveals a significant improvement in operating returns from the year preceding to the year following the buyout, as measured by operating cash flow per employee and dollar of operating assets, indicating notable efficiency improvements. Smith identifies that this enhancement in operating returns originates from effective working capital management, paralleling Kaplan's findings rather than cost-cutting strategies such as workforce reductions or decreased allocations to research and development or property, plant, and equipment. This underscores the strategic finesse in post-buyout operations.

In light of Smith and Kaplan's findings, our research intends to extend the analysis into more recent years and scrutinise the enduring impact over an extended post-deal period, emphasising all forms of PTP transactions, not limited to management buyouts. This approach aims to furnish updated insights into the lasting relevance of these findings in the modern economic climate and to ascertain whether the post-buyout performance trends pinpointed by Smith and Kaplan remain consistent.

3.2. Recent Research

In the more recent period spanning from 1990 to 2006, Guo et al. (2011) delve into the dynamics of value creation through LBOs, analysing 192 LBOs within the U.S. market. Their investigation reveals that many of these transactions lead to substantial positive returns, with operational improvements matching or modestly surpassing comparable firms. In this context, returns are calculated as the gains on invested capital from just before the LBO to the point of exit. The study delineates key factors contributing to these outcomes, including operational performance enhancements, shifts in industry valuation multiples, and tax benefits stemming from increased leverage. On average, firms undergo notable increases in total value from the buyout inception to the exit from a private equity portfolio, delivering substantial returns on invested capital, 72.5% before and 40.9% after the buyout. This value accretion is primarily attributed to firm-specific operational improvements, specifically advancements in profitability, the divestiture of non-performing assets, optimised utilisation of remaining assets, and well-executed strategic acquisitions. The upswing in market or sector valuation multiples during the private tenure of these firms, coupled with significant tax benefits derived from the leverage employed, also plays a substantive role in elevating returns for capital providers. The study notes a modest weakening in the scale of operational gains relative to those documented in the 1980s, with median performance occasionally not exceeding that of benchmarked peers.

Nonetheless, the diversity within the sample underlines the integral and persistent contribution of operational performance to the generation of returns. Guo et al. further point out that, in modest or nonexistent cash flow gains, the overall financial enhancements, particularly when considering tax benefits, are markedly accentuated for firms that have adopted greater leverage post-buyout. This finding corroborates the view that leveraging serves as an effective mechanism for reducing agency costs.

In a related context, Gill and Visnjic (2015) delve into post-privatisation operational performance with a unique focus on governance structures and ownership concentration, offering insights into the nuanced ways these factors contribute to firm efficiencies. Gill and Visnjic present an insightful examination of the operational performance of firms post-transition to private ownership, highlighting the role of concentrated ownership in driving profitability and cash flow efficiencies. Utilising a dataset of RLBOs, where publicly traded companies are taken private and re-listed, they offer a unique vantage point to evaluate performance during private ownership periods. Their analysis of 57 full RLBOs from 1980 to 2006 reveals that private equity-backed companies exhibit significant operational outperformance in several key efficiency ratios compared to a matched control group of public firms. These ratios, which include asset turnover, operating margin, return on assets, and employee productivity, indicate that firms strengthen their profitability and enhance their capacity to generate cash from operating activities. This performance is attributed to the focused corporate governance and improved incentive structures under concentrated ownership, distinct from organisational form. Although private equity portfolios represent a specialised subset of private ownership, with professional investors of limited investment horizons, the results provide a compelling proxy for the broader benefits of being closely held. This study, therefore, substantiates the hypothesis that firms undergoing LBOs improve their profit generation capabilities during periods of high ownership concentration. This finding adds a nuanced layer to the discourse on the efficiency of PTP transactions.

Focusing on the UK market, Weir (2013) leverages a hand-collected dataset to scrutinise the financial health outcomes of private-to-public transactions, providing a valuable comparative framework against the backdrop of the dot-com bubble. Building on the insights of prior studies, Weir delves into the transition dynamics of firms in the UK, analysing a dataset of 138 transactions from PTP status between 1998 and 2004. Weir's findings indicate a marked enhancement in financial health in the years following privatisation compared to the year before the transition. This improvement is also significant compared to firms that remained public during the same timeframe. The study employs the Taffler z-score to measure financial health, a

composite metric comprising four variables that assess profitability, working capital position, financial risk, and liquidity (Agarwal & Taffler, 2007). Weir's analysis reveals notable post-deal improvements in working capital and liquidity, albeit coupled with a significant decline in profitability in several post-deal years. An intriguing aspect of Weir's research is the comparison between private equity (PE) backed, and non-PE backed deals, which uncovers that both avenues lead to enhanced financial health, with negligible differentiation in outcomes between them.

While offering valuable insights, the study's temporal scope is relatively brief. It aligns with the dot-com bubble, hinting at the potential for these findings to reflect specific market conditions rather than a broader market trend. This aspect underscores the importance of contextual understanding in assessing the long-term implications of privatisation on firm performance.

4. Theoretical Framework

In this chapter, we introduce the Altman Z-score. This metric will assess financial health before and after PTP transactions.

4.1. Altman Z-Score

The Altman Z-score, a cornerstone in financial analysis since its inception by Altman in 1963, stands as a predictor of bankruptcy risk across various sectors such as mergers and acquisitions, asset management, and credit risk evaluation. Tailored initially to incorporate market data, Altman refined the Z-score in 1983 to accommodate private firms, thereby removing the reliance on stock price information. The model analyses a suite of financial ratios that provide a cumulative assessment, projecting the likelihood of corporate failure. The health of a company's finances is evaluated based on its Z-score; a score greater than 2.9 is considered within the 'Safe Zone', indicative of financial health. Scores that fall between 1.23 and 2.9 occupy a 'Gray Zone', representing a state of ambiguity, and a Z-score under 1.23 signals the 'Distress Zone', where the risk of insolvency becomes pronounced (Altman, 1983). The model is given by:

$$z = 0.717x_1 + 0.847x_2 + 3.107x_3 + 0.420x_4 + 0.998x_5$$

where the variables are defined as:

- $x_1 = \frac{Current\ Assets - Current\ Liabilities}{Total\ Assets}$
- $x_2 = \frac{Retained\ Earnings}{Total\ Assets}$
- $x_3 = \frac{Earnings\ before\ Interest\ and\ Taxes}{Total\ Assets}$
- $x_4 = \frac{Book\ Value\ of\ Equity}{Book\ Value\ of\ Total\ Liabilities}$
- $x_5 = \frac{Sales}{Total\ Assets}$

The variable x_1 measures liquidity, x_2 profitability x_3 , operational efficiency, x_4 leverage, and x_5 sales productivity.

5. Research Question and Hypotheses

Given the identified gaps in existing research, this paper seeks to explore the following research question: *What are the financial impacts of PTP transactions on firm performance?*

5.1. Financial Health Hypothesis

Weir's research, exploring the period from 1998 to 2004, identified significant enhancements in financial health following firms' privatisation. Furthermore, Weir observed that firms transitioning from public to private status exhibited better financial health than those that remained public. Similarly, Kaplan (1989a; 1989b) documented financial improvements from large management buyouts. Inspired by these findings, our study seeks to examine the applicability of these observations to a broader set of PTP transactions. Specifically, we aim to assess whether the trends identified by Weir and Kaplan extend to PTP transactions outside the previously studied contexts and timeframes. Thus, we propose the following hypotheses:

H_1 = *PTP firms will see increases in the Z-score in the post-deal years, indicating an improvement in financial health*

H_2 = *PTP firms will have a better Z-score in the post-deal years compared to their public counterparts, indicating better financial health*

5.2. Free Cash Flow Hypothesis

Drawing from Jensen's (1986) seminal work on agency costs associated with free cash flow and Kaplan's (1989a; 1989b) empirical findings on the financial improvements following management buyouts, this hypothesis investigates free cash flow management after PTP transactions. Kaplan identifies operational efficiencies contributing to increased net cash flow, indicating a strategic approach to managing free cash flow after privatisation. Additionally, Bharath and Dittmar (2010) highlight the role of substantial free cash flow levels in motivating privatisation decisions during the 1980s, emphasising the continued relevance of free cash flow considerations within these transactions.

Kaplan (1989a) utilised the median Net Cash Flow, which is calculated as the difference between operating income and capital expenditure, along with ratios of Net Cash Flow to Assets and Sales. These measures are proxies for evaluating free cash flow management in firms undergoing PTP transactions. Thus, we propose the following hypotheses:

H_3 = PTP firms will demonstrate increased Net Cash Flow to Assets Ratio and the Net Cash Flow to Sales Ratio in the post-deal years, highlighting enhanced free cash flow management.

H_4 = PTP firms will exhibit superior Net Cash Flow to Assets Ratio and Net Cash Flow to Sales Ratio in the post-deal years compared to their public counterparts, highlighting enhanced free cash flow management.

5.3. Operating Efficiency Hypothesis

Research in privatisation and corporate finance consistently indicates a trend towards higher operating efficiency in private firms. Jensen (1989) suggests that privatised entities benefit from streamlined operations and enhanced focus, leading to operational efficiencies not as easily achieved by public companies. Echoing this sentiment, Kaplan (1989a) observed that, in the aftermath of buyouts, companies tend to report significant enhancements in operating income, a testament to the operational efficiencies gained. Notably, these improvements in operating income, especially concerning assets and sales, underscore the potential for substantial operational optimisation in the years following privatisation.

In evaluating the operational efficiency of firms undergoing PTP transactions, the study draws upon key metrics established by prior research to effectively measure such efficiencies. Kaplan (1989a) provides insight into operational improvements through his analysis of operating income relative to assets and sales, demonstrating privatised firms' enhanced profitability and efficiency. This methodology aligns with the approach taken by Gill and Visnjic (2015), who further expand on the concept by introducing Asset Turnover and Operating Margin as indicators of a firm's efficiency in utilising its assets and converting sales into profit, respectively. These metrics—Return on Assets, EBIT Margin, and Asset Turnover—serve as critical tools for assessing the impact of privatisation on a firm's operational capabilities. Thus, we propose the following hypotheses:

H_5 = PTP firms will exhibit increases in Return on Assets, EBIT Margin and Asset Turnover in the post-deal years, indicating enhanced operational efficiency.

H_6 = PTP firms will exhibit superior Return on Assets, EBIT Margin and Asset Turnover in the post-deal years compared to their public counterparts, indicating enhanced operational efficiency.

5.4. Employee Efficiency Hypothesis

The discourse on employee efficiency within the context of PTP transactions draws upon diverse perspectives from the literature. Kaplan (1989a) and Smith (1990) highlight operational enhancements following buyouts, which implicitly include improvements in employee productivity. Kaplan observes stability or an increase in employment levels post-buyout, contesting that privatisation necessitates workforce reductions for cost-saving purposes. However, he found that companies undergoing buyouts experienced slower employment growth compared to industry counterparts. Similarly, Smith identifies significant gains in operating returns, emphasising the effective management of resources, including human capital. This narrative is complemented by Gill and Visnjic (2015), who introduce employee productivity as a critical measure of a firm's operational efficiency, further suggesting that private ownership structures can lead to more focused and efficient workforce use. These observations collectively underscore the complex relationship between privatisation and employee efficiency, inviting a detailed examination of how transitioning from public to private impacts this dimension of firm performance.

Our analysis will incorporate the measure of Employee Productivity to assess employee efficiency in firms undergoing PTP transactions, as elucidated by Gill and Visnjic (2015). This metric, calculated as Sales divided by the Number of Employees, provides a clear indicator of how effectively a firm leverages its human capital to generate revenue. Furthermore, this study will incorporate the Employee Growth measure, defined as the year-over-year percentage change in the number of employees. This provides insights into the firm's strategic HR decisions following privatisation, potentially indicating either an expansion or contraction of the workforce. These metrics will aid in understanding the nuanced effects of privatisation on the workforce. Thus, we propose the following hypotheses:

H_7 = PTP firms will demonstrate improved Employee Productivity with stable Employee Growth in the post-deal years, indicating more efficient workforce utilisation

H_8 = PTP firms will show superior employee productivity and reduced Employee Growth in the post-deal years compared to their public counterparts, indicating more efficient workforce utilisation

5.5. Control Function of Debt and Tax Benefits Hypothesis

The discourse on the control function of debt and tax benefits within PTP transactions highlights significant aspects of corporate finance theory and practice. Jensen's (1986) analysis introduces the concept of the control function of debt in mitigating the agency costs of free cash flow in leveraged buyouts (LBOs). This framework suggests that imposing debt obligations enhances organisational discipline, aligning management's incentives with shareholder interests and fostering operational improvements. The stringent requirements to meet debt service obligations curb wasteful expenditures and incentivise efficient asset management and cash generation, creating a competitive alternative to traditional corporate forms.

Following this conceptual groundwork, the role of tax benefits in the context of LBOs and management buyouts (MBOs) gains prominence as a significant driver of value creation in privatisation transactions. Kaplan (1989b) elucidates the substantial impact of tax advantages, highlighting how they emerge as a direct consequence of the increased debt financing typical in buyouts. These tax benefits, including large interest deductions and the strategic use of operating loss carryforwards, are documented to provide considerable wealth gains, further enhancing the attractiveness of undertaking PTP transactions. This interplay between the control function of debt and the tax benefits it facilitates underscores the multifaceted nature of value creation in privatisation, emphasising the financial strategies that underpin the transition from public to private ownership.

In conclusion, the Debt-to-Equity ratio will serve as a crucial metric, reflecting the strategic utilisation of debt post-PTP transactions to enhance tax efficiencies. This measure will help illuminate how firms leverage the tax deductibility of interest to optimise their capital structure and reduce tax liabilities, aligning with broader financial restructuring goals post-privatisation. Thus, we propose the following hypotheses:

H_9 =PTP firms will experience an increase in the Debt to Equity ratio in the post-deal years, signalling increased debt levels and associated tax benefits

H_{10} = PTP firms will experience an increase in the Debt to Equity ratio in the post-deal years compared to their public counterparts, signalling increased debt levels and associated tax benefits

6. Data

This chapter outlines the data sources for our financial analysis and describes creating the treatment and control groups using PSM. An overview of the characteristics of these groups highlights key financial metrics and industry distributions. Lastly, we detail the variables collected for our analysis, which are essential for assessing the financial impacts of PTP transactions.

6.1. Data Sources

The primary dataset for our financial analysis is sourced from the Swedish House of Finance Serrano Database. This comprehensive repository offers detailed financial histories of Swedish companies, including those not commonly available for private entities. Its uniqueness lies in the inclusion of both public and private companies; this capability is especially valuable for tracking the financial trajectories of firms involved in PTP transactions from 1998 to 2016 within Sweden. However, the database lacked detailed information regarding when firms transitioned between public and private statuses, making it difficult to accurately track these changes. Therefore, the dataset required supplementation to identify the periods during which each company was privately or publicly held.

Identifying companies that underwent delisting between 1998 and 2012 was primarily facilitated through "Owners and Power in Sweden´s Listed Companies" to help solve this issue. This publication, emanating annually from the Swedish House of Finance, proved instrumental in pinpointing companies that transitioned to unlisted status. From 2013 onwards, Nasdaq Stockholm publications were pivotal in identifying entities delisted from the Stockholm Stock Exchange. This direct source from the exchange ensured an accurate and up-to-date listing of companies transitioning out of public trading.

The data cleaning process, described in the next section, utilised additional resources, including the Swedish Tax Agency and the Swedish Companies Registration Office. This process also involved consulting annual reports and press releases available online for the respective companies. These sources provided the necessary information for thorough data validation and cleaning, which is crucial for the integrity of the analysis.

Finally, Moody's Orbis database became a cornerstone for constructing the control group. Orbis offered extensive information on all listed companies in Sweden, including crucial organisation numbers necessary for correlating data within the Serrano Database. This ensured a robust framework for comparing listed companies against their delisted counterparts.

6.2. Constructing the Treatment Group

6.2.1. Identifying Delisted Companies for the Treatment Group

The data collection process for this study was initiated by identifying companies delisted from the Stockholm Stock Exchange between 1999 and 2016. This specific period was chosen to scrutinise the impact of PTP transactions, utilising the Serrano database, which houses company data from 1998. Although the Serrano database dates back to 1998, the focus on delistings from 1999 to 2016 was deliberate, allowing for at least one year of pre-delisting observation, with our analysis extending up to 2022 for comprehensive post-delisting observation. This study concentrates on the Stockholm Stock Exchange, the main market in Sweden, which is expected to exhibit the most significant changes due to its strict regulations and scrutiny.

Data on these delisted companies was initially sourced from "Owners and Power in Sweden´s Listed Companies" for information until 2013, supplemented by details from the Nasdaq database for the subsequent years. This phase encompassed collecting data on company listings and delistings, name changes, and additional relevant comments spanning 1998-2023, ensuring the dataset's accuracy.

6.2.2. Manual Cleaning of Data

Following the identification of delisted companies, a second step involved manually cleaning the collected data. This phase started with an initial cleaning that leveraged the foundational data from the aforementioned databases, adopting a systematic approach to refine the dataset and enhance its analytical integrity. Specific criteria guided the process:

- Companies that had been delisted for a duration exceeding five years, focusing on the long-term impacts of PTP transactions.

- Companies delisted due to transitioning between stock exchanges were excluded, as these do not represent a shift to private ownership but continued public market participation.
- Entities delisted due to bankruptcy, liquidation, or mergers resulting in the dissolution of the original company were excluded, as these scenarios do not reflect a transition to private ownership.

The cleaning process involved delving into additional sources to supplement and refine the dataset. The 'Owners and Power in Sweden´s Listed Companies' up to 2010 included companies listed on other exchanges in Sweden, such as the Nordic Growth Market and OTC, not exclusively the Stockholm Stock Exchange. Additional corporate and transactional details, including organisational numbers and complete corporate names missing from initial datasets, were obtained from the Swedish Tax Agency and the Swedish Companies Registration Office. This effort was crucial for refining the dataset to align with established criteria, documenting acquiring parties, and identifying the specific exchanges on which the companies were traded to exclude entities irrelevant to the research objectives.

Verification with the Serrano database ensured exhaustive temporal coverage before and after the delisting events. Where necessary, online sources such as annual reports, press releases, and journalistic articles were utilised to fill informational gaps, ensuring a comprehensive and accurate dataset.

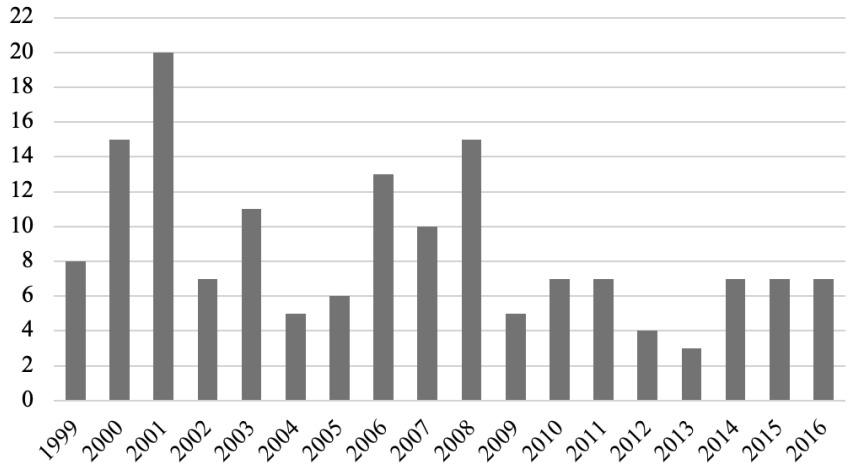
This comprehensive verification process, augmented by additional sources, was crucial in bridging data gaps and ensuring our treatment group represents companies undergoing genuine transitions from public to private ownership. This process was instrumental in constructing a treatment group that accurately represents the subset of companies transitioning from public to private ownership, underpinning the dataset's precision and relevance to the research objectives.

6.2.3. Treatment Group Characteristics

Upon completing the data-cleaning process, we identified 157 PTP transactions for our treatment group. The distribution of these transactions, charted in Exhibit 6.1 from 1998 to 2016, shows significant peaks in the years coinciding with the dot-com bubble and the financial crisis, reflecting the influence of macroeconomic forces. Section 6.5 provides a comprehensive breakdown of the financial characteristics and industry sectors of these companies.

EXHIBIT 6.1

Yearly Distribution of PTP Transactions from 1998 to 2016



6.3. Constructing the Control Group

6.3.1. Identifying Public Companies for the Control Group

The establishment of the control group for this study began with compiling a list from the Orbis database of all companies listed on the Stockholm Stock Exchange, which included their organisational numbers and IPO dates. This initial step aimed to capture a broad array of companies for potential inclusion in the control group.

The next step involved manually matching these records against Nasdaq information to differentiate companies listed on the main market of the Stockholm Stock Exchange from those on the First North market. This was necessary because the Orbis database does not distinguish between these two markets, and this study focuses on main market listings. Finally, information from before the IPO dates was excluded to ensure the dataset reflected only the period when companies were publicly traded. This adjustment aligned the control group more closely with the treatment group by focusing on the companies' public phase. After the manual cleaning, we had a control group of 329 public companies that traded on the Stockholm Stock Exchange during our time frame.

These steps provided a basis for selecting a control group of companies that remained publicly listed on the Stockholm Stock Exchange's main market, setting the groundwork for the next phase of matching these companies against the treatment group.

6.4. Propensity Score Matching

Propensity score matching (PSM) is a statistical method used to estimate the effect of a treatment or intervention by accounting for the covariates that predict receiving the treatment. In observational studies where random assignment to treatment and control groups is impossible, PSM is a robust technique to control for confounding variables, thereby reducing selection bias (Lu, 2005; Svetina, 2012; Stuart, 2010).

This method is particularly relevant in our study to assess the impact of companies transitioning from public to private ownership. The transition is not random; companies may choose to go private for various reasons influenced by their characteristics and market conditions. By matching companies that went private with similar companies that remained public based on observable characteristics, PSM allows us to approximate a randomised experiment, making the comparison between treatment and control groups valid and reliable. The MatchIt package for R, developed by Ho et al. (2011), was utilised for this purpose.

The following criteria were used for propensity score matching to compare companies that transitioned from public to private ownership with those that remained public:

- **Year of transaction**: Matching was based on the year before the PTP transition, aligning companies to the same economic conditions. See Exhibit 6.2 for a visual example.
- **Industry**: Companies were matched within the same industry sectors using standard classification systems to ensure comparable market environments.
- **Size as measured by net sales**: Matching considered companies with similar net sales to account for operational scale and market impact.
- **Profitability as measured by ROA**: Return on Asset figures were used to match companies by financial performance.

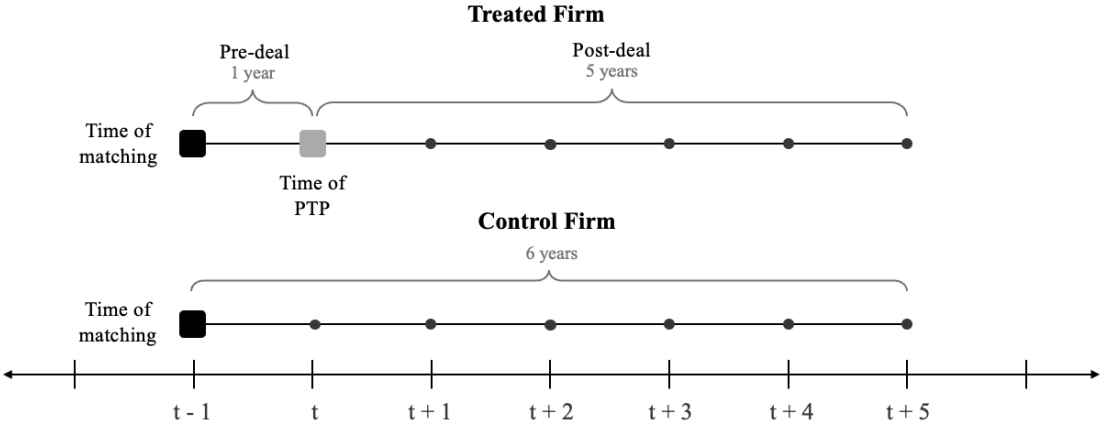
These criteria ensured that the matched control group companies mirrored the treatment group in key operational and economic aspects, facilitating a valid comparison of the effects of transitioning to private ownership.

Following the estimation of propensity scores based on the outlined criteria, nearest neighbour matching was utilised to pair companies in the treatment group with their most similar counterparts in the control group. This method involves selecting the control company

with the closest propensity score to each treatment company, ensuring the most comparable match based on the identified economic, operational, and financial characteristics. By employing nearest neighbour matching without replacement, each control company was used only once, preserving the uniqueness of each match and minimising potential bias. This approach effectively pairs companies from the treatment and control groups, providing a solid basis for the subsequent analysis of the impact of transitioning to private ownership. Exhibit 6.2 visually depicts the time frame utilised for matching treated firms with control firms during the study. The treated firms are observed for at least one year prior to the PTP and a minimum of five years post-deal, while the control firms have a corresponding observation window of at least six years, ensuring a balanced comparison of temporal data points critical for the integrity of the nearest neighbour matching process.

EXHIBIT 6.2

Visual representation of matching



6.4.1. Post-Matching Covariate Balance

The results from the MatchIt procedure demonstrate effective balancing of covariates between the treatment and control groups, as evidenced by the corresponding statistical measures in Exhibit A.1 in Appendix A. The PSM process has significantly improved the balance between the treatment and control groups for various variables. Specifically, the standard mean difference for the propensity score has been effectively minimised from 0.95 to 0.00, reflecting well-matched groups on this measure. While the variance ratios are closer to the desired value of 1, the empirical cumulative distribution function (eCDF) values also demonstrate a reduction, suggesting greater distributional alignment. Notably, the ROA's standard mean difference saw a marginal increase to -0.05. This uptick is acknowledged as part of the broader PSM strategy, which seeks to enhance group similarity across a spectrum of variables rather than perfecting

any single metric. The aggregate effect of these changes confirms an overall more balanced set of covariates post-matching.

After the matching process, each of the 157 treated subjects was paired with a control, leading to 157 matched pairs with no discarded or unmatched subjects. This indicates that the matching was efficient and effective, allowing a more accurate estimation of the treatment effects since the matched groups are now more comparable. This improvement suggests that subsequent analysis of this dataset is likely to provide less biased estimates of the treatment effect, although consideration of potential unmeasured confounders remains important.

6.5. Overview of the Treatment and Control Sample

EXHIBIT 6.3

Financial Characteristics of Treatment and Control Groups in Year t-1

	Treated Firms *n = 157*		**Control Firms** *n= 157*	
Variable	Median	Mean	Median	Mean
ROA (%)	5,28	0,85	6,64	1,34
Number of employees	495	1 858	310	1 949
Net sales (mSEK)	922	3 261	685	3 582
Total Assets (mSEK)	1 182	4 741	918	4 625
Z-Score	1,92	1,95	2,05	2,73

The financial characteristics of the treated and control firms in the year t-1 indicate an effective alignment through the propensity score matching process, as seen in Exhibit 6.3. Treated firms report a median ROA of 5.28% with a median workforce of 495, median net sales of 922 million SEK, and median total assets of 1,182 million SEK, coupled with an average z-score of 1.92. Conversely, control firms have a median ROA of 6.64% and a z-score of 2.05, with a typically smaller median number of employees at 310 and lower median net sales and assets at 685 million SEK and 918 million SEK, respectively. These financial figures validate the efficacy of the matching procedure, confirming that the treatment and control groups are comparable in key financial measures. Yet, residual differences between the groups highlight the inherent limitations of any matching process to achieve absolute equivalence.

EXHIBIT 6.4

Distribution of Firms Across Industries in Treatment and Control Groups in Year t-1

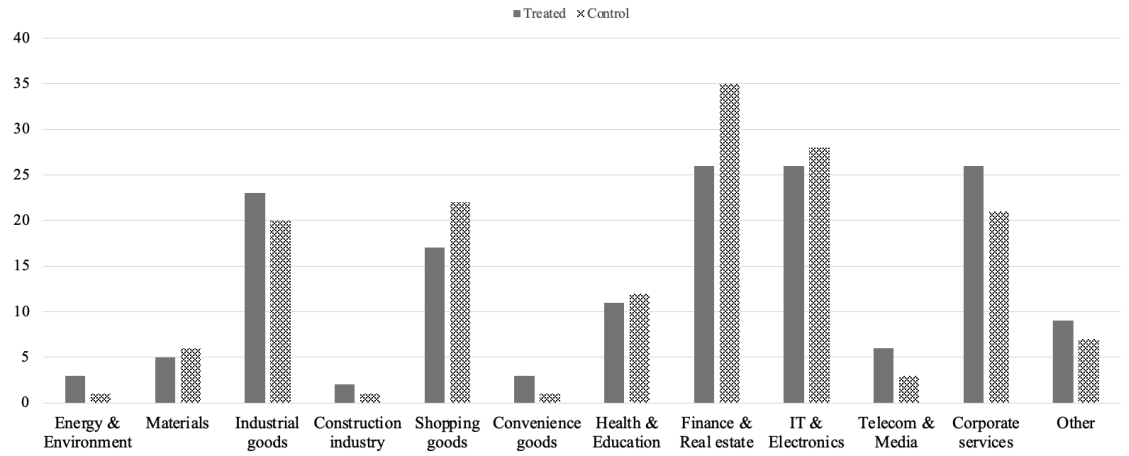


Exhibit 6.4 presents the industry distribution for the treatment group, involving 157 PTP transactions alongside 157 matched observations in the control group for the year t-1. Notably, both groups exhibit similar distributions across various sectors, which suggests that the selection process effectively matched companies from diverse industries between the treatment and control groups. The chart highlights that PTP transactions are predominantly observed in the Finance and Real Estate, IT and Electronics, and Corporate Services sectors, with notable occurrences in Industrial Goods and Shopping Goods as well.

The balanced industry distribution underscores the efficacy of the matching process in ensuring comparability between the treatment and control groups, facilitating a more robust analysis of the impact of PTP transactions across sectors.

6.6. Variables

The Serrano database collected essential data for both the treatment and control groups, including organisation number, business name, fiscal year, size category, and industry. In order to calculate the ratios required for testing our hypotheses, the following data was collected from Serrano: current assets, total assets, fixed tangible assets, depreciation, current liabilities, book

value of total liabilities, total debt, book value of equity, retained earnings, net income, EBIT, net sales, and the number of employees. The calculations for the ratios used as dependent variables are presented in Section 4.1 for the Altman Z-score and in Appendix B.1-B.4 (Appendix B) for the free cash flow, operating efficiency, employee efficiency, and control function of debt and tax benefits ratios.

The DiD regression employed industry as a control variable across all regressions to account for sector-specific effects that might influence company performance. For all regressions, except those concerning the Z-score, variables from the Altman Z-score model were utilised because they provide a comprehensive measure of a company's financial health, encompassing liquidity, profitability, and leverage. These components are critical for assessing the financial condition of companies before and after transitioning from public to private ownership. In the regression analysing Return on Assets, the x_3 component was omitted, as it directly corresponds to the dependent variable, thus ensuring the independence of the explanatory variables.

7. Methodology

This chapter describes the two main methods used to test our hypotheses: the Wilcoxon Signed-Rank Test and Difference-in-Difference Regression with Propensity Score Matching.

7.1. Wilcoxon Signed-Rank Test

The Wilcoxon Signed-Rank Test is selected for its compatibility with non-normally distributed paired samples, aligning with the study's objective to examine firms' median differences in financial metrics before and after transitioning to private ownership. The long-term impact of privatisation on firm performance is captured by comparing financial metrics at year *t-1* (one year before privatisation) with those at t+1, t+2, t+3, t+4 and t+5 (one to five years after privatisation). Its application is supported by similar financial analyses in studies by Kaplan (1989a), Smith (1990), Guo et al. (2011), and Weir (2013), highlighting its relevance to this research.

Paired observations from firms' financial metrics, pre- and post-transition, are analysed. Differences for each paired observation are calculated, and the Wilcoxon Signed-Rank Test is conducted using R's wilcox.test function. This methodological approach, consistent with previous research, provides nuanced insights into the specific financial impacts of PTP transactions on firm performance.

7.2. Difference-in-Difference Regression with Propensity Score Matching

To evaluate the causal impact of privatisation on firms' financial performance, a Difference-in-Differences (DiD) regression analysis is conducted, supplemented by propensity score matching (PSM). The DiD method is particularly well-suited for panel data, allowing for the distinction of the privatisation effect by comparing changes in financial outcomes over time between firms that have transitioned to private ownership and those that have remained public. The DiD analysis relies on the assumption of parallel trends, which holds for all variables after PSM, as shown in Exhibit C.1 in Appendix C. It implies that without privatisation, the financial performance of both treated and untreated firms would have followed a similar trajectory. PSM

enhances this approach by systematically creating matched pairs of treated and untreated firms based on observable characteristics, thereby aiming to minimise potential selection bias and more closely emulate the conditions of a randomised control trial environment.

Building on the PSM process described in 5.3.2, firms were matched using specific criteria outlined in the data chapter: transaction year, industry sector, size, and profitability. These criteria were selected to ensure that matched firms are comparable in key operational and economic aspects, facilitating a valid comparison of the effects of transitioning to private ownership.

The empirical analysis employs a DiD regression model, utilising the fixed effect OLS function (feols) from R's fixest package. Feols is commonly used for panel data analysis, supporting methodologies like DiD and PSM. It facilitates the management of multi-way fixed effects, which is important for addressing unobserved heterogeneity in data. In the context of DiD analysis, the function simplifies the incorporation of interaction terms. It enables the computation of robust standard errors, helping to mitigate serial correlation and heteroskedasticity issues in panel data. The DiD regression model, reflecting the PSM matching, is defined as follows:

$$Y_{it} = \alpha + \beta_1(TreatmentGroup_i) + \beta_2(TreatmentPeriod_i) + \beta_3(TreatmentGroup_i \times TreatmentPeriod_t) + \beta_4 TimeSinceTreatment_{it} + \gamma ControlVariables_{it} + \delta Industry_i + \varepsilon_{it}$$

Where the components are defined as:

- Y_{it} = The outcome variable for firm *i* at time *t*.
- α = The intercept or baseline level of the dependent variable in the absence of treatment (before the PTP transaction).
- β_1= The coefficient for the treatment group indicating the difference in the outcome variable for the treated firms relative to the control firms.
- β_2= The coefficient for the treatment period reflecting the difference in the outcome variable after the treatment event for all firms.
- β_3= The coefficient for the interaction term, capturing the effect of the treatment in the post-treatment period compared to the pre-treatment period.
- $TreatmentGroup_i$ = A binary indicator that equals 1 if firm *i* is treated (underwent PTP transaction) and 0 otherwise.

- $TreatmentPeriod_t$ = A binary indicator that equals 1 for periods after the treatment event, allowing for differentiation of observations in the post-treatment phase from those in the pre-treatment phase.
- β_4= The coefficient for the continuous treatment variable. It represents the incremental effect associated with each additional year after the PTP transaction, allowing for an assessment of the treatment effect over time.
- *TimeSinceTreatment* = A continuous variable that measures the years since firm *i* underwent a PTP transaction. It starts at 0 in the year of the PTP transaction and increases by 1 each year after that. For control groups, this variable remains 0 in all years.
- $\gamma ControlVariables_{it}$ = The set of coefficients associated with control variables, reflecting the effect of firm-specific characteristics and financial indicators on the outcome variable.
- $\delta Industry_i$ = A categorical variable that categorises firm *i* into an industry sector to control for industry-specific systematic differences and trends.
- ε_{it} = The error term encapsulating all other unexplained variations in the dependent variable

8. Results & Analysis

In this section, we present the findings from the Wilcoxon signed-rank test, followed by the results of the DiD regression.

8.1. Results Wilcoxon Signed-Rank Test

8.1.1. Financial Health

EXHIBIT 8.1

Wilcoxon Signed-Rank Test – Z-Score

Comparison Year	Median Z-Score	Z-Score Diff.	p-Value	Significance
t – 1	1,92			
t + 1	1,63	-0,29	0,960	
t + 2	1,72	-0,20	0,050	*
t + 3	1,50	-0,43	0,022	*
t + 4	1,67	-0,25	0,015	*
t + 5	1,00	-0,90	0,089	

Note: * indicates $p < 0.05$

The Wilcoxon Signed-Rank Test applied to median Z-scores comparing the pre-transaction year to the post-transaction years indicates a significant decrease in the Z-score after the PTP transaction. Specifically, years t + 2, t + 3, and t + 4 evidenced statistically significant reductions in Z-scores at the 5% level. Initially in the Gray Zone with a median Z-score of 1.92 at t − 1, the scores decreased to 1.72 in t + 2, moved further into the Gray Zone at 1.50 in t + 3, and returned slightly to 1.67 in t + 4, as detailed in Exhibit 8.1. These scores all indicate a continued distress risk but remain above the critical Distress Zone threshold of 1.23. Conversely, the initial post-transaction years t + 1 and t + 5 did not demonstrate statistical significance in their Z-score changes.

In contrast to Hypothesis 1, which anticipated an enhancement in financial health as reflected by an increase in the Z-score during the post-deal years, as posited by Weir (2013) and Kaplan (1989a, 1989b), the empirical findings indicate a decline in the Z-score at t+2, t+3, and

t+4. This decline suggests a deterioration rather than an improvement in financial health, leading to the rejection of Hypothesis 1.

8.1.2. Employee Efficiency

EXHIBIT 8.2

Wilcoxon Signed-Rank Test – Employee Productivity

Comparison Year	Median Employee Productivity (mSEK)	Employee Productivity Diff. (mSEK)	p-Value	Significance
t – 1	1,66			
t + 1	1,70	0,04	0,388	
t + 2	1,66	-0,01	0,254	
t + 3	1,82	0,16	0,143	
t + 4	2,04	0,38	0,085	.
t + 5	1,78	0,12	0,015	*

Note: * indicates p < 0.05, . indicates p < 0.1

The Wilcoxon Signed-Rank Test, applied to median Employee Productivity, revealed a statistically significant increase only in the t + 5 comparison year. Exhibit 8.2 shows that the median productivity at t - 1 was 1.66 mSEK. This figure showed only marginal and statistically insignificant changes in the years t + 1, t + 2, and t + 3. By year t + 4, there was an increase to 2.04 mSEK, which was significant only at the 10% level. A more notable rise to 1.78 mSEK in year t + 5 was observed, which achieved statistical significance at the 5% level.

Furthermore, there have been no significant changes in Employee Growth in the post-deal years compared to the pre-deal years for the firms that underwent a PTP transaction. The results for the Wilcoxon Signed-Rank Test for Employee Growth can be found in Exhibit D.1 (Appendix D.1).

To conclude, our findings point to a significant enhancement in Employee Productivity in the long term by the year t+5, accompanied by stable Employee Growth throughout the post-PTP transaction period. These outcomes resonate with the research proposed by Kaplan (1989a), Smith (1990), and Gill and Visnjic (2015), which underscore potential efficiency gains in workforce utilisation post-PTP. Given this alignment, we support Hypothesis 7, positing that PTP firms would exhibit improved Employee Productivity post-deal without compromising workforce expansion.

8.1.3. Free Cash Flow, Operating Efficiency and Control Function of Debt and Tax Benefits

Exhibit D.2, as detailed alongside Exhibit D.3 (Appendix D.2), shows that the Wilcoxon Signed-Rank Test revealed no statistically significant changes in either the Net Cash Flow to Assets Ratio or the Net Cash Flow to Sales Ratio when comparing the pre-deal year to the post-deal years. Consequently, Hypothesis 3, which posited significant post-deal improvements in both these ratios, is not supported.

Furthermore, the Return on Assets, EBIT Margin, and Asset Turnover Ratio, as presented in Exhibits D.4, D.5 and D.6 (Appendix D.3), demonstrated no significant changes in the post-deal years. Therefore, Hypothesis 5, which anticipated post-transaction improvements in these metrics, is not supported.

Lastly, the analysis of the debt-to-equity ratio, provided in Exhibit D.7 (Appendix D.4), yielded no significant findings. This result leads to the conclusion that Hypothesis 9, which suggested a post-deal increase in leverage, is not supported.

8.2. Results DiD Regression

8.2.1. Financial Health

EXHIBIT 8.3

DiD estimation, Dep. Var.: Z-Score

Observations: 5 216

Standard-errors: IID

Variables	Estimate	Std- Error	t-Value	p-Value	Significance
(Intercept)	3,93	0,75	5,22	0,000	***
TreatmentGroup	-2,10	0,70	-3,00	0,003	**
TreatmentPeriod	-0,84	0,61	-1,38	0,169	
TimeSinceTreatment	0,01	0,19	0,03	0,974	
Industry	0,00	0,01	-0,12	0,908	
TreatmentGroup x TreatmentPeriod	0,43	1,88	0,23	0,819	

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 17.7 Adj. R2: 0.001241

The DiD analysis shown in Exhibit 8.3 assessed Hypothesis 2, predicting better post-deal financial health for PTP firms than those staying public, as measured by the Z-score. The TreatmentGroup's negative coefficient, with an estimate of -2,10, is significant at the 1% level, which implies a decrease in the Z-score for PTP firms, contrary to expectations. The non-significant coefficient for the TreatmentGroup × TreatmentPeriod interaction with an estimate of 0,43 indicates no evidence of relative improvement in financial health for PTP firms post-deal. Consequently, Hypothesis 2 is not supported.

EXHIBIT 8.4

DiD estimation, Dep. Var.: X2

Observations: 5 231

Standard-errors: IID

Variables	Estimate	Std- Error	t-Value	p-Value	Significance
(Intercept)	0,06	0,04	1,34	0,181	
TreatmentGroup	-0,03	0,04	-0,87	0,385	
TreatmentPeriod	0,13	0,03	3,69	0,000	***
TimeSinceTreatment	0,06	0,01	5,29	0,000	***
Industry	0,00	0,00	-1,92	0,054	.
TreatmentGroup x TreatmentPeriod	-0,71	0,11	-6,71	0,000	***

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 1,00477 Adj. R2: 0,013865

Furthermore, when looking at the individual variables that constitute the Altman Z-score, the DiD analysis for the retained earnings to total assets ratio (x_2), as seen in Exhibit 8.4, yielded a significant interaction effect, indicating that the treatment group experienced a decrease in this ratio after the PTP transition. Specifically, the interaction term is significant at the 1% level, determining a statistical reduction in retained earnings relative to total assets for firms undergoing PTP transactions.

EXHIBIT 8.5

DiD estimation, Dep. Var.: X5

Observations: 5 234

Standard-errors: IID

Variables	Estimate	Std- Error	t-Value	p-Value	Significance
(Intercept)	1,09	0,03	31,39	0,000	***
TreatmentGroup	0,19	0,03	5,76	0,000	***
TreatmentPeriod	-0,10	0,03	-3,51	0,000	***
TimeSinceTreatment	-0,03	0,01	-3,95	0,000	***
Industry	0,00	0,00	-2,95	0,003	**
TreatmentGroup x TreatmentPeriod	0,15	0,09	1,77	0,077	.

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 0,817961 Adj. R2: 0,021289

For the sales to total assets ratio (x_5), as seen in Exhibit 8.5, the DiD results indicate a positive interaction term between the TreatmentGroup and TreatmentPeriod, significant at the 10% level. There is evidence suggesting an improvement in the sales efficiency of PTP firms compared to the control group, even though this significance level does not meet the conventional threshold.

For the remaining components, liquidity x_1, operational efficiency x_3, and leverage x_4, the DiD estimations did not show any significant interaction effects. These variables did not exhibit a statistically significant change in the post-PTP period for the treatment group compared to the control group. Detailed results for these variables are included in Exhibits E.1, E.2, and E.3 (Appendix E.1). The lack of significant interaction terms at the 5% level suggests that the PTP transition did not impact these specific financial health indicators within this study's scope.

8.2.2. Free Cash Flow

EXHIBIT 8.6

DiD estimation, Dep. Var.: Net Cash Flow to Assets Ratio

Observations: 4 885

Standard-errors: IID

Variables	Estimate	Std- Error	t-Value	p-Value	Significance
(Intercept)	-0,083	0,01	-10,49	0,000	***
TreatmentGroup	0,002	0,01	0,24	0,808	
TreatmentPeriod	0,010	0,01	1,84	0,067	.
TimeSinceTreatment	-0,003	0,00	-1,54	0,123	
Industry	0,000	0,00	0,34	0,733	
X1	0,008	0,01	1,05	0,292	
X2	-0,005	0,00	-2,02	0,044	*
X3	1,108	0,01	126,53	0,000	***
X4	0,000	0,00	1,96	0,050	.
X5	0,010	0,00	3,74	0,000	***
TreatmentGroup x TreatmentPeriod	0,018	0,02	1,06	0,290	

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 0,155737 Adj. R2: 0,789018

The regression results shown in Exhibit 8.6 suggest intricate dynamics in the Net Cash Flow to Assets Ratio of firms undergoing PTP transactions. Contrary to Hypothesis 4, which was grounded on Jensen's (1986) theory of agency costs and Kaplan's (1989a; 1989b) empirical work that posited enhanced free cash flow management post-PTP, the TreatmentGroup variable, representing whether a firm underwent a PTP transaction, is not statistically significant. This indicates that simply being a PTP firm does not differentiate Net Cash Flow to Assets Ratio from non-PTP firms. However, the variable of TreatmentPeriod, although not significant at the conventional 5% level, suggests a positive direction consistent with Hypothesis 4, hinting at a potential improvement in the Net Cash Flow to Assets Ratio post-treatment. The interaction of TreatmentGroup and TreatmentPeriod, crucial to the DiD estimation, is also not significant, which fails to support the Hypothesis that PTP transactions lead to superior management of free cash flow in the post-deal years relative to public counterparts.

EXHIBIT 8.7

DiD estimation, Dep. Var.: Net Cash Flow to Sales Ratio

Observations: 4 886

Standard-errors: IID

Variables	Estimate	Std- Error	t-Value	p-Value	Significance
(Intercept)	-2,685	0,40	-6,79	0,000	***
TreatmentGroup	0,756	0,33	2,28	0,023	*
TreatmentPeriod	1,056	0,29	3,69	0,000	***
TimeSinceTreatment	0,073	0,08	0,88	0,380	
Industry	0,010	0,01	1,55	0,120	
X1	-1,733	0,36	-4,85	0,000	***
X2	-0,277	0,12	-2,39	0,017	*
X3	6,743	0,44	15,33	0,000	***
X4	0,001	0,00	0,33	0,744	
X5	1,062	0,14	7,54	0,000	***
TreatmentGroup x TreatmentPeriod	-2,045	0,85	-2,41	0,016	*

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 7,79127 Adj. R2: 0,065803

In contrast to the regression in Exhibit 8.6, Exhibit 8.7 yields statistically significant results that support Hypothesis 4. The TreatmentGroup variable's significance at 5% aligns with the proposed Hypothesis 4, which anticipates that PTP firms will demonstrate a higher Net Cash Flow to Sales Ratio, suggesting effective cash flow management after privatisation. This is further reinforced by the TreatmentPeriod variable's significance at the 0,1% level, indicating an improvement in the Net Cash Flow to Sales Ratio during the post-treatment phase.

However, the TreatmentGroup × TreatmentPeriod interaction displays a statistically significant negative coefficient at the 5% level, indicating that while the Net Cash Flow to Sales Ratio for both the treatment and control groups improved over time, the increase for PTP firms was less than that observed for the control group, after accounting for the general time trend. This reduction suggests that any initial positive impact from the PTP transaction does not persist, potentially reflecting a reversion to industry performance norms or the erosion of initial gains in efficiency as time elapses following the PTP event.

In summary, the DiD regression does not support Hypothesis 4 concerning free cash flow management post-PTP transaction, as indicated by the significant negative coefficient of the interaction term.

8.2.3. Operating Efficiency

EXHIBIT 8.8

DiD estimation, Dep. Var.: Return on Assets

Observations: 5 216

Standard-errors: IID

Variables	Estimate	Std- Error	t-Value	p-Value	Significance
(Intercept)	-0,044	0,01	-3,58	0,000	***
TreatmentGroup	-0,010	0,01	-0,95	0,343	
TreatmentPeriod	0,047	0,01	5,19	0,000	***
TimeSinceTreatment	0,004	0,00	1,38	0,169	
Industry	-0,001	0,00	-2,70	0,007	**
X1	0,076	0,01	6,60	0,000	***
X2	0,086	0,00	24,03	0,000	***
X4	0,000	0,00	0,00	0,999	
X5	0,031	0,00	7,07	0,000	***
TreatmentGroup x TreatmentPeriod	0,015	0,03	0,55	0,581	

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 0,257734 Adj. R2: 0,122634

The regression analysis of Return on Assets, as shown in Exhibit 8.8, illustrates factors contributing to operational efficiency. While the TreatmentGroup's influence on Return on Assets is not statistically significant, the positive and significant TreatmentPeriod effect at the 0,1% level indicates an overall improvement in the post-treatment period. However, the non-significant TreatmentGroup x TreatmentPeriod interaction term demonstrates that the anticipated advantage for PTP firms in enhancing Return on Assets, as stated in Hypothesis 6, is not evident from the data.

EXHIBIT 8.9

DiD estimation, Dep. Var.: EBIT Margin

Observations: 5 185

Standard-errors: IID

Variables	Estimate	Std- Error	t-Value	p-Value	Significance
(Intercept)	-1,934	0,34	-5,64	0,000	***
TreatmentGroup	0,756	0,28	2,66	0,008	**
TreatmentPeriod	1,191	0,25	4,77	0,000	***
TimeSinceTreatment	0,105	0,08	1,39	0,166	
Industry	0,010	0,01	1,66	0,096	.
X1	-1,907	0,32	-5,99	0,000	***
X2	-0,330	0,11	-3,14	0,002	**
X3	6,776	0,39	17,574	0,000	***
X4	-0,000	0,00	-0,12	0,906	
X5	0,637	0,12	5,21	0,000	***
TreatmentGroup x TreatmentPeriod	-2,196	0,76	-2,88	0,004	**

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 7,10408 Adj. R2: 0,074027

The regression on EBIT Margin in Exhibit 8.9 forms an important part of the analysis of operational efficiency post-PTP transactions. The positive relationship with the TreatmentGroup, significant at the 1% level, suggests that firms in the treatment group experienced enhanced profit margins compared to the control group. The TreatmentPeriod is similarly positive and significant at the 0,1% level, indicating an initial improvement in operational efficiency following the privatisation event for both groups. However, the negative and significant interaction term at the 1% level between TreatmentGroup and TreatmentPeriod suggests that treated firms experience diminished EBIT Margins compared to untreated firms.

Therefore, while PTP transactions initially increase profitability, the effect diminishes over time, hinting at a potential regression toward pre-privatisation efficiency levels or a stabilisation of a new norm. Thus, Hypothesis 6 concerning EBIT margin is not supported.

EXHIBIT 8.10

DiD estimation, Dep. Var.: Asset Turnover Ratio

Observations: 5 216

Standard-errors: IID

Variables	Estimate	Std- Error	t-Value	p-Value	Significance
(Intercept)	1,046	0,04	28,96	0,000	***
TreatmentGroup	0,193	0,03	6,03	0,000	***
TreatmentPeriod	0,101	0,03	-3,58	0,000	***
TimeSinceTreatment	-0,036	0,01	-4,23	0,000	***
Industry	-0,002	0,00	-2,33	0,020	*
X1	0,160	0,04	4,46	0,000	***
X2	-0,010	0,01	-0,82	0,413	
X3	0,306	0,04	7,0706	0,000	***
X4	-0,002	0,00	-5,73	0,000	***
TreatmentGroup x TreatmentPeriod	0,175	0,09	2,03	0,043	*

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 0,809144 Adj. R2: 0,040715

Shifting the focus to the Asset Turnover Ratio in Exhibit 8.10, which evaluates asset use efficiency in generating sales, the regression analysis uncovers a strong positive effect for the TreatmentGroup at the 0,1% level, echoing the findings related to EBIT Margin. However, the significantly negative coefficient for the TreatmentPeriod noted at the 0,1% level indicates a decrease in the Asset Turnover ratio after the treatment event for both the treated and their matched control firms. Notably, the interaction term TreatmentGroup x TreatmentPeriod shows a positive coefficient with a 5% significance level, implying that privatised firms improve their asset efficiency compared to their public counterparts. This pattern underscores the benefits of privatisation on operational efficiency and supports Hypothesis 5 concerning Asset Turnover.

Integrating the results from these three regressions, Hypothesis 6's assertion of post-PTP operational efficiency gains finds partial support. While the Asset Turnover ratio shows improvements for PTP firms compared to public firms, the EBIT Margin results indicate a decline, and the return on assets does not support a sustained operational efficiency advantage resulting from PTP transactions.

8.2.4. Employee Efficiency

EXHIBIT 8.11

DiD estimation, Dep. Var.: Employee Productivity

Observations: 5 199

Standard-errors: IID

Variables	Estimate (mSEK)	Std- Error (mSEK)	t-Value	p-Value	Significance
(Intercept)	6,47	2,28	2,84	0,000	***
TreatmentGroup	0,84	1,85	0,45	0,650	
TreatmentPeriod	1,58	1,64	0,96	0,337	
TimeSinceTreatment	-2,09	0,49	-4,24	0,000	***
Industry	-0,00	0,04	-0,05	0,957	
X1	-7,07	2,55	-2,78	0,005	**
X2	0,46	0,68	0,68	0,498	
X3	3,47	2,51	1,38	0,17	
X4	0,11	0,02	7,14	0,000	***
X5	-25,17	0,80	-3,15	0,002	**
TreatmentGroup x TreatmentPeriod	26,26	4,97	5,28	0,000	***

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 46478004,1 Adj. R2: 0,020265

In the analysis of Employee Productivity following PTP transactions, the regression results presented in Exhibit 8.11 reveal no significant differences attributable to PTP status alone, as indicated by the TreatmentGroup variable. Additionally, the TreatmentPeriod variable shows no significant differences in productivity post-treatment. However, a significant negative effect is observed over time with TimeSinceTreatment at the 0,1% level, suggesting a decline in Employee Productivity as time elapses post-PTP. The positive coefficient for the interaction term between TreatmentGroup and TreatmentPeriod, significant at the 0.1% level, demonstrates that privatised firms experience a substantial improvement in Employee Productivity relative to their public counterparts, aligning with the hypothesis that privatisation leads to more efficient workforce utilisation.

EXHIBIT 8.12

DiD estimation, Dep. Var.: Employee Growth

Observations: 4 881

Standard-errors: IID

Variables	Estimate	Std- Error	t-Value	p-Value	Significance
(Intercept)	-0,145	0,83	-0,17	0,862	
TreatmentGroup	0,157	0,70	0,22	0,822	
TreatmentPeriod	-0,052	0,60	-0,09	0,931	
TimeSinceTreatment	-0,733	0,18	-4,19	0,000	***
Industry	0,004	0,01	0,29	0,770	
X1	0,334	0,75	0,44	0,657	
X2	0,184	0,24	0,76	0,446	
X3	-0,193	0,92	-0,21	0,83	
X4	-0,001	0,01	-0,10	0,917	
X5	0,059	0,30	0,20	0,742	
TreatmentGroup x TreatmentPeriod	9,030	1,78	5,06	0,000	***

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 16,4 Adj. R2: 0,004521

Exhibit 8.12 illustrates the impact of privatisation on Employee Growth, providing insight into post-PTP strategic human resource decisions. The TreatmentGroup variable's lack of statistical significance indicates that PTP status alone does not account for differences in Employee Growth. However, the TimeSinceTreatment variable demonstrates a significant negative trend at the 0.1% level, signifying a reduction in employee numbers or decelerated growth post-PTP. Notably, the significantly positive interaction term at the 0.1% level suggests an uptick in hiring within firms after privatisation, possibly reflecting transitional operational needs or new strategic directions.

The analysis from Exhibits 8.11 and 8.12 indicates that while PTP transactions do not immediately affect employee productivity or growth, there is evidence over time of increased productivity and workforce growth in PTP firms compared to public ones. This mixed outcome partially supports Hypothesis 8, suggesting that PTP firms may become more efficient in their workforce utilisation post-deal.

8.2.5. Control Function of Debt and Tax Benefits

EXHIBIT 8.13

DiD estimation, Dep. Var.: Debt to Equity Ratio

Observations: 5 216

Standard-errors: IID

Variables	Estimate	Std- Error	t-Value	p-Value	Significance
(Intercept)	1,571	0,17	9,22	0,000	***
TreatmentGroup	0,278	0,14	1,98	0,048	*
TreatmentPeriod	-0,007	0,12	-0,05	0,958	
TimeSinceTreatment	-0,032	0,04	-0,86	0,389	
Industry	-0,019	0,00	-6,83	0,000	***
X1	-0,344	0,16	-2,18	0,029	*
X2	0,047	0,05	0,90	0,367	
X3	0,272	0,19	1,43	0,15	
X4	-0,001	0,00	-0,97	0,332	
X5	-0,342	0,06	-5,62	0,000	***
TreatmentGroup x TreatmentPeriod	0,410	0,38	1,09	0,278	

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 3,5436 Adj. R2: 0,015819

The regression analysis presented in Exhibit 8.13 examines the Debt to Equity ratio, revealing that the TreatmentGroup variable is positively and significantly associated at the 5% level, suggesting that firms undergoing privatisation carry a higher Debt to Equity ratio than their non-privatised counterparts. Aside from this, there is no additional evidence to suggest that the privatisation treatment influences the Debt to Equity ratio in any other significant manner, leading to the conclusion that the data do not substantiate Hypothesis 10.

8.3. Summary of Results

EXHIBIT 8.14

Summary of results

	Hypothesis	Measurement	Expected Effect	Observed Effect	Supported?
Financial Health	H1	Z-score	Positive	Negative	No
	H2	Z-score	Positive	No Effect	No
Free Cash Flow	H3	Net Cash Flow to Assets Ratio	Positive	No Effect	No
		Net Cash Flow to Sales Ratio	Positive	No Effect	No
	H4	Net Cash Flow to Assets Ratio	Positive	No Effect	No
		Net Cash Flow to Sales Ratio	Positive	Negative	No
Operating Efficiency	H5	Return on Assets	Positive	No Effect	No
		EBIT Margin	Positive	No Effect	No
		Asset Turnover	Positive	No Effect	No
	H6	Return on Assets	Positive	No Effect	No
		EBIT Margin	Positive	Negative	No
		Asset Turnover	Positive	Positive	Yes
Employee Efficiency	H7	Employee Productivity	Positive	Positive	Yes
		Employee Growth	Stable	Stable	Yes
	H8	Employee Productivity	Positive	Positive	Yes
		Employee Growth	Negative	Positive	No
Control Function of Debt	H9	Debt / Equity	Positive	No Effect	No
	H10	Debt / Equity	Positive	No Effect	No

H_1 = PTP firms will see increases in the Z-score in the post-deal years, indicating an improvement in financial health

H_2 = PTP firms will have a better Z-score in the post-deal years compared to their public counterparts, indicating better financial health

H_3 = PTP firms will demonstrate increased Net Cash Flow to Assets Ratio and the Net Cash Flow to Sales Ratio in the post-deal years, highlighting enhanced free cash flow management.

H_4 = PTP firms will exhibit superior Net Cash Flow to Assets Ratio and Net Cash Flow to Sales Ratio in the post-deal years compared to their public counterparts, highlighting enhanced free cash flow management.

H_5 = PTP firms will exhibit increases in Return on Assets, EBIT Margin and Asset Turnover in the post-deal years, indicating enhanced operational efficiency.

H_6 = PTP firms will exhibit superior Return on Assets, EBIT Margin and Asset Turnover in the post-deal years compared to their public counterparts, indicating enhanced operational efficiency.

H_7 = PTP firms will demonstrate improved Employee Productivity with stable Employee Growth in the post-deal years, indicating more efficient workforce utilisation

H_8 = PTP firms will show superior employee productivity and reduced Employee Growth in the post-deal years compared to their public counterparts, indicating more efficient workforce utilisation

H_9 =PTP firms will experience an increase in the Debt to Equity ratio in the post-deal years, signalling increased debt levels and associated tax benefits

H_{10} = PTP firms will experience an increase in the Debt to Equity ratio in the post-deal years compared to their public counterparts, signalling increased debt levels and associated tax benefits

9. Discussion

This thesis examined the financial impact of PTP transactions on firms in the Swedish market. Our analysis covered critical aspects such as financial health, free cash flow, operating efficiency, employee efficiency, and the control function of debt and tax benefits, providing a nuanced understanding of the consequences of PTP transactions. This chapter discusses the broader implications of our results, identifies limitations, and suggests directions for future research.

9.1. Broader Implications of the Results

The mixed outcomes observed from the PTP transactions underscore the complexity inherent in corporate ownership structures and their financial implications. Our findings reveal that while certain aspects like employee productivity and asset turnover showed improvements after PTP, others, such as free cash flow and employee growth, did not align with the expected benefits posited by previous literature focused on specific buyouts like LBOs, RLBOs, and MBOs. This divergence highlights that private ownership may not universally be preferable to public ownership. Instead, it suggests that the effectiveness of an ownership structure may vary significantly based on specific organisational needs and market contexts. Consequently, asserting a one-size-fits-all superiority of private over public ownership is reductive. The mixed results emphasise the necessity for a tailored approach in deciding the optimal ownership structure, taking into account a company's specific financial and operational goals. This nuanced understanding can guide firms and policymakers in making informed decisions that align with their strategic objectives and their unique challenges.

9.2. Limitations

The primary limitation of this study arises from its reliance on the Serrano Database for data collection. While this database offers extensive financial histories of Swedish firms, it lacks specific details on the exact timing of transitions between public and private statuses. This gap necessitated the integration of data from various supplementary sources, which might have introduced inconsistencies and affected the completeness of the treatment group data.

Additionally, the dataset may not comprehensively cover all relevant variables, restricting our ability to delve into more nuanced aspects of PTP transactions.

Another challenge lies in the construction of the control group. Although PSM was employed to create a comparable control group, residual differences between firms transitioning to private ownership and those remaining public could still influence the findings. These differences might stem from the financial metrics used for matching and broader strategic, cultural, and market considerations that are difficult to capture or control for, potentially introducing bias into our comparative analysis.

Furthermore, the explanatory power of our models, particularly the DiD regression, was limited. This suggests that other unobserved factors could influence the financial performance of PTP firms. Such limitations necessitate caution in interpreting the results, as the models may not fully account for the complex, firm-specific dynamics that affect performance post-PTP transaction.

9.3. Directions for Further Research

The findings of this study provide valuable insights into the impact of PTP transactions, highlighting both immediate and longer-term effects. However, several areas remain unexplored. Future research could explore a third group of firms that have never gone public, comparing them against PTP firms and those that remain public. This comparison would elucidate the financial benefits and drawbacks of transitioning from public to private ownership and help determine the optimal ownership for firms, considering their age, industry, and stage within the corporate life cycle.

Further studies could delve into the temporal dynamics of PTP transactions, examining how the effects evolve over extended periods. This approach might provide a clearer picture of the initial benefits and challenges of PTP transactions, alongside their long-term sustainability or regression to pre-transaction levels. Future research could also consider contextual influences, such as macroeconomic conditions, industry trends, and regulatory changes, which may significantly shape the outcomes of PTP transactions. By accounting for these factors, researchers can better understand how external environments interact with internal financial metrics, shaping the success of PTP firms.

In conclusion, while this thesis presents a comprehensive analysis of the financial impacts of PTP transactions in the Swedish market, further research is needed to refine our understanding. This should involve exploring diverse corporate trajectories, longer-term outcomes, and contextual influences, providing a holistic view of PTP transactions and their role in shaping firms' financial trajectories.

10. Conclusion

This paper aimed to explore the financial impact of PTP transactions on firm performance. The following conclusion summarises the effects of PTP transactions on financial health, free cash flow, operating efficiency, employee efficiency, and the control function of debt. It scrutinises the alignment between theoretical expectations and observed post-transaction performance.

The investigation into financial health post-PTP transactions unveiled a significant decline in firms' Z-scores, contrary to expectations. However, this study's comparative analysis reveals that PTP firms did not demonstrate inferior or superior financial health compared to their public counterparts post-transaction. This implies that although PTP transactions may result in internal deterioration, these declines do not significantly stand out compared to publicly listed companies.

Analysis of free cash flow post-transaction indicated that PTP firms did not realise the projected increases in the Net Cash Flow to Assets or Sales ratios. This outcome suggests that the anticipated positive impacts of PTP transactions on cash flow management were not evident. Additionally, there was no discernible advantage in cash flow management relative to assets when comparing PTP and public firms. Notably, the Net Cash Flow to Sales Ratio declined significantly for PTP firms relative to their public counterparts, signalling a departure from the expected post-privatisation cash flow efficiency.

Regarding operating efficiency, no significant post-transaction improvements were observed in Return on Assets or EBIT Margin for PTP firms. When benchmarked against public companies, PTP firms neither achieved the hypothesised enhancement in Return on Assets nor a positive effect on EBIT Margin; in fact, the latter showed a negative effect. However, a marked increase in asset turnover was noted, suggesting that PTP firms could improve the efficiency with which their assets generated sales post-privatisation despite mixed overall results.

Regarding employee efficiency, the study noted a marked improvement in productivity alongside stable Employee Growth in PTP firms following the transaction, reflecting a more efficient workforce utilisation. Compared to public firms, PTP entities upheld their productivity gains and observed a strategic increase in Employee Growth. This consolidates the view that PTP transactions can culminate in a more effective workforce, as was achieved in the observed productivity gains.

Finally, the study's exploration of the control function of debt and tax benefits did not identify a significant post-transaction increase in the Debt to Equity ratio for PTP firms, suggesting no substantial change in leverage that could signal enhanced tax benefits. This was further substantiated by the lack of significant change in the Debt to Equity ratio compared with that of public firms. These findings suggest that the anticipated leverage advantages of PTP transactions and the associated tax benefits may not materialise as frequently as expected.

In conclusion, the mixed results across these financial metrics indicate that PTP transactions do not uniformly outperform or underperform public entities. This nuanced view emphasises that there is no universally optimal ownership model; the effectiveness of PTP transactions likely depends on context-specific factors that extend beyond financial metrics.

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Appendix

A. PSM Balancing of Covariates

EXHIBIT A.1

	All Data					
PSM Variable	Means Treated	Means Control	Std. Mean Diff.	Var. Ratio	eCDF Mean	eCDF Max
distance	0,14	0,05	0,95	2,03	0,33	0,52
Year	2005	2012	-1,46	0,65	0,29	0,47
Industry	41,15	38,57	0,13	1,32	0,03	0,09
Net sales (mSEK)	3 261	8 380	-0,63	0,15	0,07	0,13
ROA (%)	0,85	0,56	0,01	0,76	0,03	0,10

	Matched Data						
PSM Variable	Means Treated	Means Control	Std. Mean Diff.	Var. Ratio	eCDF Mean	eCDF Max	Std. Pair Dist.
distance	0,14	0,14	0,00	1,02	0,00	0,01	0,00
Year	2005	2005	0,01	1,03	0,01	0,04	0,22
Industry	41,15	40,37	0,04	1,2	0,02	0,05	0,98
Net sales (mSEK)	3 261	3 614	-0,04	0,47	0,05	0,10	0,50
ROA (%)	0,85	2,03	-0,05	1,27	0,06	0,13	0,80

Sample Sizes:	Control	Treated
All	2 762	157
Matched	157	157
Unmatched	2 605	0
Discarded	0	0

B. Calculations for Financial Ratios

B.1. Free Cash Flow Ratios

- $Net\ Cash\ Flow\ to\ Total\ Assets\ Ratio\ = \frac{Operating\ income - Capital\ expenditure}{Total\ Assets}$
- $Net\ Cash\ Flow\ to\ Total\ Sales\ Ratio\ = \frac{Operating\ income - Capital\ expenditure}{Sales}$

B.2. Operating Efficiency Ratios

- $Return\ on\ Assets\ = \frac{EBIT}{Total\ Asset}$
- $EBIT\ Margin\ = \frac{EBIT}{Sales}$
- $Asset\ Turnover\ = \frac{Sales}{Total\ Assets}$

B.3. Employee Efficiency Ratios

- $Employee\ Productivity\ = \frac{Sales}{Number\ of\ employees}$
- $Employee\ Growth\ = \frac{Number\ of\ employees_{t} - Number\ of\ employees_{t-1}}{Number\ of\ employees_{t-1}}$

B.4. Control Function of Debt and Tax Benefits Ratios

- $Debt\ to\ Equity\ Ratio\ = \frac{Total\ Debt}{Total\ Equity}$

C. Parallel trends assumption DiD

EXHIBIT C.1

Pre-Treatment Parallel Trends Assumption Tests (t-5 to t-1)

Variable	Interaction Term Estimate	p-Value	Implications
Z-Score	0,63	p = 0.316	Parallel trends hold
ROA	-0,01	p = 0.627	Parallel trends hold
X1	0,00	p = 0.929	Parallel trends hold
X2	-0,01	p = 0.600	Parallel trends hold
X3	-0,01	p = 0.627	Parallel trends hold
X4	1,50	p = 0.315	Parallel trends hold
X5	0,02	p = 0.545	Parallel trends hold
CF to Assets Ratio	-0,01	p = 0.593	Parallel trends hold
CF to Sales Ratio	-0,30	p = 0.509	Parallel trends hold
EBIT Margin	-0,10	p = 0.780	Parallel trends hold
Asset Turnover Ratio	0,02	p = 0.545	Parallel trends hold
Employee Productivity	28450	p = 0.924	Parallel trends hold
Employee Growth	-0,02	p = 0.253	Parallel trends hold
Debt to Equity Ratio	0,01	p = 0.869	Parallel trends hold

D. Insignificant Wilcoxon Signed-Rank Tests

D.1. Employee Efficiency

EXHIBIT D.1

Wilcoxon Signed-Rank Test – Employee Growth

Comparison Year	Median Employee Growth	Employee Growth Diff. (pp)	p-Value	Significance
t – 1	4,10%			
t + 1	0,00%	-4,10%	0,460	
t + 2	2,50%	-1,60%	0,443	
t + 3	3,90%	-0,20%	0,622	
t + 4	2,00%	-2,10%	0,300	
t + 5	-2,90%	-7,00%	0,165	

D.2. Free Cash Flow

EXHIBIT D.2

Wilcoxon Signed-Rank Test – Net Cash Flow to Assets Ratio

Comparison Year	Median CF to Assets	CF to Assets Diff. (pp)	p-Value	Significance
t – 1	0,70%			
t + 1	-2,50%	-3,10%	0,82	
t + 2	1,00%	0,30%	0,54	
t + 3	2,40%	1,70%	0,65	
t + 4	-0,50%	-1,10%	0,63	
t + 5	2,70%	2,10%	0,24	

EXHIBIT D.3

Wilcoxon Signed-Rank Test – Net Cash Flow to Sales Ratio

Comparison Year	Median CF to Sales	CF to Sales Diff. (pp)	p-Value	Significance
t – 1	0,50%			
t + 1	-2,80%	-3,30%	0,22	
t + 2	1,10%	0,60%	0,82	
t + 3	3,40%	2,90%	0,61	
t + 4	-0,40%	-0,90%	0,63	
t + 5	6,10%	5,60%	0,26	

D.3. Operating Efficiency

EXHIBIT D.4

Wilcoxon Signed-Rank Test – Return on Assets

Comparison Year	Median ROA	ROA Diff. (pp)	p-Value	Significance
t – 1	5,30%			
t + 1	0,60%	-4,70%	0,79	
t + 2	4,60%	-0,70%	0,89	
t + 3	5,00%	-0,30%	0,77	
t + 4	4,70%	-0,60%	0,47	
t + 5	5,30%	0,00%	0,65	

EXHIBIT D.5

Wilcoxon Signed-Rank Test – EBIT Margin

Comparison Year	Median EBIT margin	EBIT margin Diff. (pp)	p-Value	Significance
t – 1	5,2%			
t + 1	1,5%	-3,70%	0,54	
t + 2	4,0%	-1,20%	0,75	
t + 3	5,0%	-0,20%	0,54	
t + 4	4,8%	-0,40%	0,26	
t + 5	8,1%	2,90%	0,45	

EXHIBIT D.6

Wilcoxon Signed-Rank Test – Asset Turnover

Comparison Year	Median Asset Turnover	Asset Turnover Diff. (pp)	p-Value	Significance
t – 1	110,00%			
t + 1	94,50%	-15,50%	0,10	
t + 2	81,70%	-28,30%	0,68	
t + 3	98,00%	-12,00%	0,75	
t + 4	88,90%	-21,10%	0,49	
t + 5	97,10%	-12,90%	0,16	

D.4. Control Function of Debt and Tax Benefits

EXHIBIT D.7

Wilcoxon Signed-Rank Test – Debt to Equity Ratio

Comparison Year	Median D/E	D/E Diff. (pp)	p-Value	Significance
t – 1	20,70%			
t + 1	8,80%	-11,90%	0,793	
t + 2	14,30%	-6,40%	0,509	
t + 3	12,70%	-8,00%	0,170	
t + 4	24,30%	3,60%	0,597	
t + 5	60,00%	39,30%	0,554	

E. Insignificant DiD

E.1. Z-Score Variables

EXHIBIT E.1

DiD estimation, Dep. Var.: X1

Observations: 5 237

Standard-errors: IID

Variables	Estimate	Std- Error	t-Value	p-Value	Significance
(Intercept)	0,30	0,01	22,62	0,000	***
TreatmentGroup	-0,08	0,01	-6,13	0,000	***
TreatmentPeriod	-0,10	0,01	-9,48	0,000	***
TimeSinceTreatment	0,00	0,00	0,38	0,701	
Industry	0,00	0,00	-4,35	0,000	***
TreatmentGroup x TreatmentPeriod	-0,05	0,03	-1,64	0,101	

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 0,315633 Adj. R2: 0.032397

EXHIBIT E.2

DiD estimation, Dep. Var.: X3

Observations: 5 225

Standard-errors: IID

Variables	Estimate	Std- Error	t-Value	p-Value	Significance
(Intercept)	0,02	0,01	1,47	0,142	
TreatmentGroup	-0,01	0,01	-1,10	0,273	
TreatmentPeriod	0,05	0,01	5,02	0,000	***
TimeSinceTreatment	0,01	0,00	2,64	0,008	**
Industry	0,00	0,00	-3,85	0,000	***
TreatmentGroup x TreatmentPeriod	-0,05	0,03	-1,61	0,107	

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 0,273332 Adj. R2: 0,013594

EXHIBIT E.3

DiD estimation, Dep. Var.: X4

Observations: 5 230

Standard-errors: IID

Variables	Estimate	Std- Error	t-Value	p-Value	Significance
(Intercept)	5,99	1,78	3,36	0,001	***
TreatmentGroup	-5,12	1,65	-3,10	0,002	**
TreatmentPeriod	-2,19	1,45	-1,51	0,131	
TimeSinceTreatment	-0,08	0,44	-0,17	0,864	
Industry	0,01	0,03	0,35	0,723	
TreatmentGroup x TreatmentPeriod	2,52	4,44	0,57	0,571	

Signif. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

RMSE: 42,0 Adj. R2: 0,00123