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JOHANNES CEBULLA

THE IMPACT OF PRIVATE EQUITY AND VENTURE CAPITAL INVESTMENTS ON INDUSTRY PERFORMANCE

EVIDENCE FROM LATIN AMERICA

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Thesis presented to Escola de Administração de Empresas de São Paulo of Fundação Getulio Vargas, as a requirement to obtain the title of Master in International Management (MPGI).

Knowledge Field: Economia e Finanças Internacionais

Adviser: Prof. Dr. Rafael F. Schiozer

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ABSTRACT

The growth of the private equity industry over the last decades has risen the importance of understanding how private equity investments impact the overall economy. While the existing research has mainly focused on the impact of private equity investments on firm performance, this study examines the impact of private equity investments on industry performance. Moreover, in contrast to most of the existing private equity literature, it focuses on emerging market countries in the post-financial crisis period, using a novel dataset provided by the Association for Private Capital Investments in Latin America (LAVCA), which contains information on private equity investments in Latin American industries between 2009 and 2018. Thus, this paper helps in understanding the impact of private equity investments in different industry settings. The study finds that employment, free cash flow, and capital expenditure of public companies grow faster in industries that receive private equity investments in the previous years. Contrarily, labor productivity and industry returns show reduced growth rates following private equity investments. The paper does not find evidence for industry spillovers regarding profitability or net debt growth.

Keywords: private equity, venture capital, industry spillover, emerging markets, Latin America

RESUMO

O crescimento da indústria de private equity nas últimas décadas aumentou a importância de entender como os investimentos em private equity impactam na economia geral. Embora a pesquisa existente tenha se concentrado principalmente no impacto dos investimentos em private equity sobre o desempenho das empresas-alvo, este estudo examina o impacto dos investimentos em private equity sobre o desempenho de setores de atividade econômica. Além disso, em contraste com a maior parte da literatura existente sobre private equity, ele se concentra em mercados emergentes no período pós crise financeira, utilizando uma nova base de dados fornecida pela Association for Private Capital Investments in Latin America (LAVCA), que contém informação sobre investimento em private equity em diferentes setores econômicos na América Latina entre 2009 e 2018. Assim, este artigo ajuda a entender melhor o impacto dos investimentos em private equity em diferentes contextos setoriais. O estudo demonstra que o emprego, o fluxo de caixa livre e as despesas de capital das empresas listadas crescem mais rapidamente em setores que recebem investimentos de private equity nos anos anteriores. Por outro lado, a produtividade do trabalho e os retornos da indústria mostram taxas de crescimento reduzidas após os investimentos de private equity. O estudo não encontra evidências de repercussões setoriais em termos de crescimento de rentabilidade ou dívida líquida.

Palavras-chave: capital privado, capital de risco, efeito de arrasto industrial, mercados emergentes, América Latina

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LIST OF ABBREVIATIONS

CAGR	Compound Annual Growth Rate
ICB	Industry Classification Benchmark
IPO	Initial Public Offering
LAVCA	Association for Private Capital Investments in Latin America
LBO	Leveraged Buyout
OECD	Organization for Economic Co-operation and Development
PE	Private Equity
R&D	Research and Development
UK	United Kingdom
US	United States of America
USD	United States Dollar
VC	Venture Capital

1 Introduction

Since the sharp drop in the private equity (PE)[1] activity observed in the aftermath of the global financial crisis in 2008, the PE industry has shown a steady growth in both developed and emerging markets that indicates its regaining economic relevance (Bain & Company, 2019; LAVCA, 2019). The increasing importance of the PE industry in the economy has also revitalized the public controversy about the potentially adverse impact of these investments on the target firm and overall industry performance. Regulators, labor unions, and other stakeholders point to several case studies that show harmful industry practices such as excessive leveraging or layoffs to generate short-term profits for investors to the detriment of long-term value creation. A paragon of these practices is the multiple buyout of Simmons Bedding Company that finally filed for bankruptcy after its leverage reached an unsustainable level following its seventh PE sale in two decades. While many employees lost their jobs and pension plans in these transactions, several Wallstreet investment firms cashed in considerable profits (Creswell, 2009).

Contrary to these detrimental case studies and public concerns, most of the existing literature indicates that PE investments have mainly beneficial impacts on the operational and financial performance of target firms. Only the impact of PE investments on employment and wage levels shows mixed empirical results (Kaplan & Strömberg, 2009; Wood & Wright, 2009; Wright, et al., 2009; Cumming, et al., 2007). However, there is still scarce empirical evidence regarding the impact of PE on the overall industry performance, which is based on the idea that operational, financial or governance changes implemented at PE-backed firms can spillover to industry peers. On the one hand, investments might have a positive impact on the overall industry performance as competitors are forced to implement similar performance improvements as conducted at the target firms to remain competitive. On the other hand, industry peers might be pressured to adopt adverse short-term engineering measures or might not be able to keep up with the implemented improvements at target firms, leading to industry-wide performance losses.

Therefore, the impact of PE investments on industry peers is not only a relevant topic for academics but also for policymakers that must adapt the financial regulation according to the empirical evidence on how PE investments impact the overall economic welfare. In the aftermath of the global financial crisis of 2008, the European Commission, for instance, implemented more restrictive PE regulations due to the notion that PE and other alternative investments could hamper the performance and stability of the local economic and financial

[1] If not separately indicated, the definition of PE in this thesis includes both PE (buyout) and venture capital.

system (European Commission, 2018). In contrast, Brazil enacted a new PE regulation in 2017 to facilitate “the activities of fund administrators, portfolio managers and investors in Brazil” (Cintra, 2017), as PE investments were associated with mainly positive economic impacts.

While an ample literature has already shown positive technology and productivity spillovers from multinational corporations to local firms (Blomström & Kokko, 1998), there are only two recent studies by Bernstein et al. (2017) and Aldatmaz & Brown (2013) that address the impact of PE investments on industry performance. Both studies find mainly evidence of an improved industry performance following PE investments, indicating positive industry spillover effects. However, although both studies include some emerging market industries, there is no existing research that focuses specifically on the impact of PE investments on industry performance in emerging markets or Latin America in particular. The lack of research is understandable as most of PE capital is still concentrated in developed markets such as the US and Western Europe. Nevertheless, the share of PE investments in emerging markets has risen significantly since the early 2000s, which increases the relevance to focus on the impact of PE investments in these markets (Bain & Company, 2019). This is especially the case as emerging markets show different industry dynamics and institutional frameworks that might alter the manners by which PE investments impact target firm and industry performance compared to developed markets. Aldatmaz & Brown (2013) show, e.g., that industry spillover effects following PE investments show different patterns in countries with a better quality of legal institutions and intellectual property rights as well as modest levels of innovative capacities. Regarding these factors, Latin America and other emerging markets show substantial differences from developed markets (The Worldbank, 2019; Property Rights Alliance, 2018; World Economic Forum, 2018). Similarly, Ribeiro et al. (2008) and de Carvalho et al. (2014) outline several peculiarities of the PE activity in Brazil as compared to the US, showing differences in the legal and institutional setting, fund structures, and investment and exit strategies in emerging market countries. Besides, there is scarce literature that focuses on the impact of PE investments in the post-financial crisis period that might be characterized by different industry dynamics and PE investment strategies due to the steep decline in investments in PE during the financial crisis (Bernstein, et al., 2017).

To address these issues, I investigate the relation between PE investments and several economic and financial performance measures of public peers operating in the same country-industry as the investment target, based on a sample of Latin American PE investments between 2009 and 2018. The PE data used for this analysis is provided by the Association for Private Capital Investments in Latin America (LAVCA) and represents the most comprehensive data on both Latin American PE and venture capital (VC) activity. In total, it covers USD 65

billion of PE investments across six Latin American countries and nine different industries, providing actual USD deal values at the country-industry level. To control for heterogeneity across countries, industries, and years, I include country-industry and industry-year fixed effects in the baseline model specification. Thus, the impact of PE investments is measured against the average performance in a given country, industry and year.

I find that the employment of public companies grows significantly faster in country-industries with PE investments in the previous two to five years. Moreover, free cash flow and capital expenditures of public peers grow significantly faster in industries where PE capital was allocated in the previous five years. In contrast, the labor productivity growth of public peers is significantly lower in industries with PE investments in the previous two to five years. Similarly, industry returns of public rivals grow significantly lower in industries with PE investments in the previous five years. Regarding profitability and net debt growth, I find no significant difference between industries with and without PE investments in the previous years.

A general concern is that the results might be driven by reverse causality, i.e., that PE investments may be directed towards industries in which higher performance growth is anticipated. Although it is not possible to completely address this problem, I provide suggestive indications that PE investments are the driving force of the results. First, reverse causality is partially mitigated by considering the impact of PE investments in the five years before the observed industry performance variable growth. Second, I repeat the panel analyses with a twice-lagged PE industry definition that excludes PE investments in the previous year and only considers investments two to five years before the observation. By doing so, PE investors would need to be highly foresighted to anticipate industry performance growth two years into the future. In the case of employment and labor productivity, results in fact only show a significant impact on growth rates when the year before the observation is excluded. Third, the impact of PE investments on labor productivity and industry returns is negative, which makes reverse causality less likely as investors would not deliberately allocate funds to industries in which they anticipate lower growth. Fourth, from a theoretical point of view, a growth-anticipation strategy is only profitable when the growth is not anticipated by the market and thus not incorporated in the acquisition price.

This paper contributes to the literature that analyses how firm performance changes following PE investments. First, it adds to the existing research by analyzing the impact of PE in an emerging market setting for the period after the global financial crisis in 2008. Second, it provides evidence that implemented performance changes do not only affect target firms but also spillover to domestic industry peers. By doing this, it also provides evidence of an industry

spillover channel in emerging markets other than multinational corporations, which is the most studied in the literature.

Apart from the impossibility of addressing the problem of reverse causality, there are some further limitations to this research. First, as this paper analyzes the spillover effects from PE-backed firms to public peers, it provides only limited insights into the impact of PE investments on the overall industry performance as public firms represent only a small fraction of the whole industry in most of the Latin American countries. Second, this paper cannot draw a clear distinction between VC and PE (buyout) capital due to data limitations, although there might be substantial differences as to how these two different investment types affect target firm and industry performance. Finally, this paper does not address several aspects apart from performance growth that are relevant for economic policymakers when assessing the impact of PE investments and designing financial regulation as, for example, the impact on cyclicality or the distribution of wealth and income across society.

The rest of the paper proceeds as follows: Section 2 gives a short overview of the existing literature regarding the impacts of PE investments on firm and industry performance. Section 3 presents the data sources and sample construction as well as descriptive analyses. Section 4 describes the empirical strategy applied in this research, and Section 5 presents the main results. Section 6 offers concluding comments.

2 Theoretical Foundations

In the following, this paper presents the existing literature regarding the impact of PE investments. First, it gives a short definition of PE investments and outlines their development in developed markets and Latin America. Second, it relates to the large and increasing number of studies, which analyze how PE investments affect the company performance of their investment targets. Third, the paper refers to the impact of PE investments on the performance of the industries in which the target company operates.

2.1 Definition and Development of PE Investments

PE investments are defined as direct investments in privately held companies or buyouts of public companies to delist them. Direct investments in privately held firms are mainly carried out by VC firms that acquire major equity stakes with a low degree of leverage in emerging and growing companies. In a typical leveraged buyout, a specialized investment firm (or leveraged buyout investment firm) carries out the transaction with a high degree of leverage

and a relatively small share of equity and obtains the majority control of a mature firm. In both cases, the PE firms obtain a majority control or at least a major equity share. Therefore, they can exercise a significant influence on the company's decision making to implement financial, operational, and governance changes. The objective of these measures is to improve the firm performance and, thus, to create value for the PE investors by reselling or listing the investment target.

PE investments mainly developed in the US during the 1980s. Since then they have expanded to Europe and subsequently to Asia and other emerging markets since the early 2000s. Notwithstanding, PE activity is still mainly concentrated in the US, which accounted for approx. 54% of global PE investments in 2018. In recent years, China has emerged as another major PE destination, amounting to 18% of global PE investments (Bain & Company, 2019; Statista, 2019). In contrast, Latin America is a relatively small destination of global private capital accounting only for approx. 1% of global private investments (LACVA, 2019). The first PE investments in Latin America appeared in the late 1980s and early 1990s but were mainly limited to infrequent deals by local families that leveraged their local networks to buy assets in market downcycles. International and institutional investors only entered Latin America after the liberal market reforms in the 1990s, leading to a steady surge of investments until the financial crises in Brazil and Argentina in the late 1990s and early 2000s, which destroyed investor confidence in the region and led to the breakdown of regional investments. However, PE capital returned to the region in the forerun of the global financial crisis as the region showed years of steady growth. This new wave of regional PE investments was further fueled by the global financial crisis that several Latin American countries could escape relatively unscathed (Schiffrin, 2013). Since then, PE investments have experienced steady growth in Latin America, however, remaining relatively small on a global scale. Similarly, Checa et al. (2001) and de Carvalho et al. (2014) describe the evolution and growth of the PE industry in Brazil, the largest destination for PE investments in Latin America.

2.2 The Impact of PE Investments on Firm Performance

Regarding the impact on the target firm performance, Jensen's hypothesis that PE investments can improve the performance of target firms is the most recognized in the finance literature (Jensen, 1989). According to Jensen (1989), the performance improvements can be achieved through an enhanced alignment of incentives between managers and owners and a more efficient use and allocation of resources. Similarly, Kaplan & Strömberg (2009) and most of other researchers subdivide the means of PE firms to achieve performance improvements at target firms into three different categories: operational, governance, and financial engineering. Operational engineering refers to the application of operating and industry

expertise (e.g., implementation of new management practices or technologies) at the target firm to enhance operational efficiency. Governance engineering relates to changes concerning the monitoring of managers and the alignment of manager incentives to cope with agency problems. Finally, financial engineering concerns the efficient use of leverage to restrict free cashflow misuse and to create value through the tax deductibility of interest (Kaplan & Strömberg, 2009).

Several case studies show the positive effects of these engineering measures on company performance, as, e.g., demonstrated by Luehrman & Scott (2007) and Baker & Wruck (1989). However, in the public discussion, several stakeholders and authors highlight the harmful impacts of PE transactions through industry practices such as excessive leveraging and expenditure cutting or asset stripping for short-term profit gains to the detriment of long-term value creation. The negative impacts related to such practices as the extensive loss of jobs, substantial wage cuts, or financial distress are also well-documented in several case studies, e.g., by Stowell (2018, p. 395ff.), Rasmussen (2008) or The Service Employees International Union (2007 and 2008).

Nevertheless, an increasing number of empirical studies seem to consolidate Jensen's hypothesis of the positive effects of PE investments on firm performance. However, it is necessary to highlight that most of these studies focus on PE investments in developed markets such as the US, UK, and further member countries of the European Union in the period before the global financial crisis. Another general caveat to the presented evidence is the strong heterogeneity of PE investments regarding value creation strategies, target industries, investment stage and type, transaction size, leverage, period, and geography that can lead to disparate performance impacts at target firms. Siqueira et al. (2011) and de Carvalho et al. (2017) show, e.g., that the success of PE investments in Brazil depends on a variety of different factors.

Hereafter, this paper first presents the empirical evidence regarding the impact of PE investments on financial and operational performance and second on employment and wage levels.

Cumming et al. (2007) show in their comprehensive review paper that most early and recent studies related to the impact of PE show an improved financial and operational performance at the target firm concerning a wide range of different measures. Similarly, the review papers by Kaplan & Strömberg (2009), Wood & Wright (2009), and Wright et al. (2009) provide summarized empirical evidence for both operational and financial performance gains following PE investments. Additionally, Wilson et al. (2012) show that significant productivity

and profitability increases also persisted during the financial crisis. Complementing these findings, several authors show the improved stock market performance of PE-backed IPOs in comparison to non-PE-backed IPOs, which indicates a positive impact on long-term value creation even after PE firms leave the target (Leves, 2011; Bruton, et al., 2010; Cao & Lerner, 2009; Katz, 2009). Minardi et al. (2013) show these results also for PE-backed IPOs in Brazil. Sincerre et al. (2019) complement these findings by providing evidence for the persistence of improved financial and operational performance of PE-backed firms in the years following Brazilian IPOs. Another indicator of the long-term value creation is the positive impact of PE on the target firm's innovation capacity, e.g., measured by the number and effectiveness of patenting activities, as demonstrated by both Amess et al. (2016) and Lerner et al. (2013). Moreover, Wright et al. (2009) summarize evidence that indicates that product development and other types of corporate entrepreneurship increase following PE investments.

As suggested by the finance theory, the improved financial and operational performance can often be linked to managerial and governance improvements at the target firm. The World Economic Forum (2009) and Bloom et al. (2015) both conclude that PE-owned firms depict improved management practices, especially regarding operational and human resource management practices. Similarly, de Carvalho et al. (2008) describe the positive impact of VC activity on human resource management. The improvements in management practices are often closely linked to the government mechanisms established by PE firms. In this regard, the review papers of both Wright et al. (2009) and Cumming et al. (2007) find a positive impact of PE investments on management supervision, the general market for corporate control and governance structures that improve performance, e.g., through the reduction of free cash flow and agency problems. Acharya et al. (2009) and Cornelli & Karakaş (2008) further confirm these findings by showing the positive effects of PE investments on the board structure and value creation mindset of boards at target firms. Additionally, Gioielli et al. (2013) show a reduction in earnings management in Brazilian IPOs for PE and VC-backed firms, showing the positive impact of PE investments on external accounting in Latin America.

Notwithstanding, there are some studies providing counter-evidence to the predominantly positive effects of PE investments on firm performance. Leslie & Oyer (2008) find little evidence of improved financial and operational performance and show that debt and compensation level differentials with public firms rapidly disappear after going public. Additionally, Kaplan & Strömberg (2009) summarize several studies that find evidence for increased investor performance, but only modest operational and financial performance increases at the target firm level. Another caveat is the significant increase in debt levels at target companies following PE investments, as shown by Axelson et al. (2007) and Leslie &

Oyer (2008). Consistent with this increase in leverage, Strömberg (2008) and Sudarsanam et al. (2011) find an increased default probability of PE-backed firms. Additionally, there seems to be evidence of an increase in asset sales at target firms to realize strategic refocusing or to restructure the capital structure (Wright, et al., 2009).

Another area of intense research and public controversies is the impact of PE investments on employment. While the public discussion is mainly limited to the negative impact of PE investments such as redundancies and wage cuts in favor of short-term investors, the empirical evidence regarding this topic is very mixed. Comprehensive review papers that address employment and remuneration effects present a large variety of different studies that show positive as well as insignificant and negative impacts on employment and wage development after PE investments (Kaplan & Strömberg, 2009; Wood & Wright, 2009; Wright, et al., 2009; Cumming, et al., 2007). Additionally, empirical evidence shows a strong heterogeneity concerning different periods and types of PE investments.

The mixed evidence regarding employment and wages indicates that the operational and financial improvements are not generally realized at the expense of employees. However, more recent research papers studying European PE investments find mainly negative impacts on employment and wage growth (Antoni, et al., 2019; Goergen, et al., 2014). Analyzing the employment effects over time, Cressy et al. (2007) and Davis et al. (2008) find that PE-backed firms show slower employment growth in the first years following the PE investment in comparison to the control group but faster or similar growth in the fourth and fifth year. These findings suggest that initial rationalization due to restructuring could allow for more job creation post-restructuring. Similarly, Davis et al. (2014) show that PE-backed firms exhibit higher job losses at existing establishments but higher job creation at new establishments with only modest net job losses. The findings indicate that PE investments foster the creative destruction in the workforce, mainly by reallocating jobs to different establishments.

In short, most of the empirical evidence shows positive impacts of PE investments on operational and financial performance. The impact on employment remains mainly mixed but suggests higher employee turnover at the target firm level due to creative job destruction processes.

2.3 The Impact of PE Investments on Industry Performance

Although of great importance for economic policymakers, the literature regarding PE investments on the overall industry performance is still scarce. However, from a theoretical point of view, the presented evidence regarding the impact of PE investments is likely to not only affect the target firms themselves but also other firms operating in the same industry. On

the one hand, the financial, operational, and governance improvements implemented at target firms might spill over to industry peers as they are pressured to implement similar changes to remain competitive, leading to potential industry-wide performance gains. Moreover, the increased takeover threat for underperforming peer companies reinforces these competitive pressures that might trigger new performance-increasing strategies (Stowell, 2018). The buyout of car rental firm Hertz Corporation in 2005 provides an example of these positive industry spillovers due to PE-induced competitive effects. Shortly after the buyout, Hertz's two main competitors, Avis-Budget and Dollar-Thrifty, implemented extensive efficiency measures similar to those applied at Hertz Corporation. As a result, all three firms were able to improve their operational and financial performance (Aldatmaz & Brown, 2013). On the other hand, PE investments might harm the overall industry if adverse engineering measures spillover to competitors or if competitors are not able to keep pace with performance changes implemented at target firms. For instance, the PE-backed firm might realize performance gains to the detriment of their peers by capturing larger parts of the total demand. These negative industry spill-overs could, for example, be observed in the 2008 buyout of gaming company Caesars entertainment that led to industry-wide redundancies and the deterioration of industry financials (Aldatmaz & Brown, 2013).

The idea of PE-induced industry spillovers relates to the general concept of knowledge spillovers between firms as introduced and illustrated by Arrow (1962) and Romer (1986). Glaeser et al. (1992) summarize these ideas in an industry spillover model, concluding that industry-specific knowledge spills over within an industry after its creation. Similarly, Porter (1990) describes knowledge spillovers in specialized and geographically concentrated industries. Several empirical studies provide evidence for these industry spillovers, especially regarding spillovers from multinational corporations to local firms via foreign direct investments. Blomström & Kokko (1998) review several studies regarding spillovers from multinational corporations and conclude that there are productivity and technology spillovers within an industry driven by competition and company or employee interaction. Moreover, Bernstein & Nadiri (1989) show that there are R&D spill-overs within industries that positively impact the financial and operational performance of firms. In contrast, Aitken & Harrison (1999) find that foreign direct investments in Venezuela had adverse effects on the productivity of domestic companies.

Regarding the competitive effects of PE, Chevalier (1995a and 1995b) demonstrates that buyouts in the supermarket industry improved the operational and financial performance of local competitors. Moreover, Oxfam & Yildrim (2008) show that changes in the governance structure of PE-backed firms spill over to competitors. Similarly, Harford et al. (2014) find

modest governance improvements for public competitors following LBOs. Regarding the financial performance of peer companies, Harford & Kolasinski (2014) find positive abnormal returns of listed industry peers upon the LBO announcement. Moreover, Harford et al. (2015) show that positive abnormal returns of public industry peers following LBOs persist after the announcement due to an increased probability of subsequent LBOs and strategic acquisitions in the same industry. Additionally, they provide evidence for higher levels of real investments at industry peers and an increased likelihood of engaging in strategic alliances. On the contrary, Hsu et al. (2010) find evidence for a decline in operating performance and stock prices at competing firms, indicating the reduced competitiveness of peers followed by a PE investment in the same industry.

This paper directly relates to the work of Aldatmaz & Brown (2013), who show for a sample of emerging and developed markets in the period between 1990 and 2011 that PE investments in a given industry are associated with higher employment, profitability, labor productivity and capital expenditure growth at public peers in the same domestic industry. Moreover, they show that the effects of PE investments are more pronounced in country-industries with higher competition levels, which supports the competitive effect theory of PE. With respects to the institutional and technological environment, they provide evidence that the PE spillover impacts are concentrated in countries with a better quality of legal institutions and intellectual property rights as well as modest levels of innovative capacity. Additionally, they analyze differences of these spillover effects between venture and buyout capital and suggest that buyout transactions are more likely to create spillovers through financial engineering and governance changes, whereas VC investments induce industry spillovers via innovation and the introduction of new technologies. Regarding industry financials, they find an increase in net debt growth at public industry peers following buyout investments indicating financial engineering spillovers. However, these changes in the capital structure of industry peers are associated with reduced stock returns, while VC transactions lead to improved stock performance and no leverage changes at competing firms.

Moreover, this paper refers to the recent study by Bernstein et al. (2017), which analyzes the impact of PE investments on the whole industry, including private and public companies in OECD countries over the period from 1991 to 2007. Their results show that industries with at least one PE investment in the last five years exhibit improved total production, value added, employment, and total wage growth. The findings also suggest that there are only modest differences in the industry growth rates between industries with high and low amounts of PE investments. Regarding industry cyclicality, their paper shows that PE

investments do not lead to higher volatility with respect to industry cycles. In the case of total wages, the presence of PE investments even lowered the downside risks of industry cycles.

Besides, both papers by Aldatmaz & Brown (2013) and Bernstein et al. (2017) include various robustness tests to check for reverse causality that suggest that PE investments are the driving force of improved industry performance and not vice versa.

Summarizing the industry-level impact of private investments, there is evidence that operational and financial improvements implemented at PE-backed firms spill over to peers operating in the same country-industry and are not realized to their detriment.

3 Data Sources and Sample Construction

This paper combines several sources of data to analyze the impact of PE on industry performance. The first dataset contains information about PE investments in Latin America compiled by LAVCA. The second data set comprises information about industry performance retrieved from DataStream's Global Equity Indices. Finally, I use country-level data from various national statistical institutes or central banks in Latin America and exchange rates data from the OECD to normalize PE investments.

3.1 PE Data

The PE data comes from LAVCA, a non-profit membership organization with the mission to accelerate regional economic growth in Latin America by promoting private capital investments. Currently, LAVCA's members comprise regional and international private capital investors, with over USD 65 billion of assets under management that are directed at investing in Latin American businesses (LAVCA, 2019).

Since 2008, LAVCA gathers data on Latin American PE and VC fundraising, investments, and exits from primary and secondary sources, mainly based on its own semiannual "Fund Manager Survey" on PE and VC activity in Latin America. This survey encompasses information from over 400 fund management firms active in Latin America and the Caribbean, representing the most comprehensive and accurate dataset on Latin American PE and VC activity. On average, over 95% of transactions contain financial details (or a range of transaction size) and are validated via primary sources. The results of the survey are published in LAVCA's annual Industry Data & Analysis report.

For this paper, I joined LAVCA's annual Industry Data & Analysis reports to create a single data set, containing data on Latin American private investments from 2009 to 2018. The main variables are the number of deals and the USD amount of PE capital invested at the country-industry-year level. An exemplary observation would be the number of PE investments in the Health Care industry in Chile in 2013. In total, the data covers the six major private capital destinations in Latin America, namely Argentina, Brazil, Chile, Colombia, Mexico, and Peru. The other Latin American private capital destinations are summed together under "Other Countries" and are not used for the construction of this dataset.

As LAVCA uses its own industry classification, I mapped the PE data into the Industry Classification Benchmark (ICB), which is used by DataStream's Global Equity Indices to be able to match both data sets. As LAVCA's industry classification does not always match the definitions of ICB's 19 supersectors, I chose the broader ICB industry classification containing ten industries. Additionally, as the LAVCA data shows no split between the Retail and Consumer Product industry, I merge the Consumer Goods and Consumer Services industries of the ICB for empirical purposes. One problem is that roughly 7% of deals and 20% of the USD amount of private capital invested do not contain an industry classification and are summed up under "Other". Regarding the amount of private capital invested, this problem is accentuated for countries other than Brazil, which show large investment amounts classified under "Other". Especially Peru and Chile, with 68% and 55% of total investment amounts classified as "Other" exhibit a very imprecise industry classification. However, these two countries account for only 3.4% and 6.3% of total private capital invested in the sample of countries. In contrast, Brazil, which accounts for 63.4% of private capital invested in the sample countries, classifies only 8.7% of investments as "Others". To mitigate the measurement problems with the imprecise classification of deal sizes, I impute the missing deal values by calculating fitted values by regressing observed deal sizes on the number of deals as well as country, industry, and year fixed effects (following Bernstein et al., 2017). After that, I generate deal size estimates for the country-industry-year level and insert them into missing values. Moreover, to check the robustness of the results, I perform the analyses in Section 5 with and without the fitted values. Additionally, I repeat the analyses after excluding Chile and Peru from the dataset.

To measure PE activity in a given country-industry, I construct several PE dummies (following Bernstein et al., 2017). First, I use a dummy variable to indicate if a given industry is a PE industry (PE_5). A PE industry is defined as an industry with at least one PE investment in the previous five years. The advantage of this measure is that it only considers the presence of PE investments in an industry and is well defined even in the absence of information about

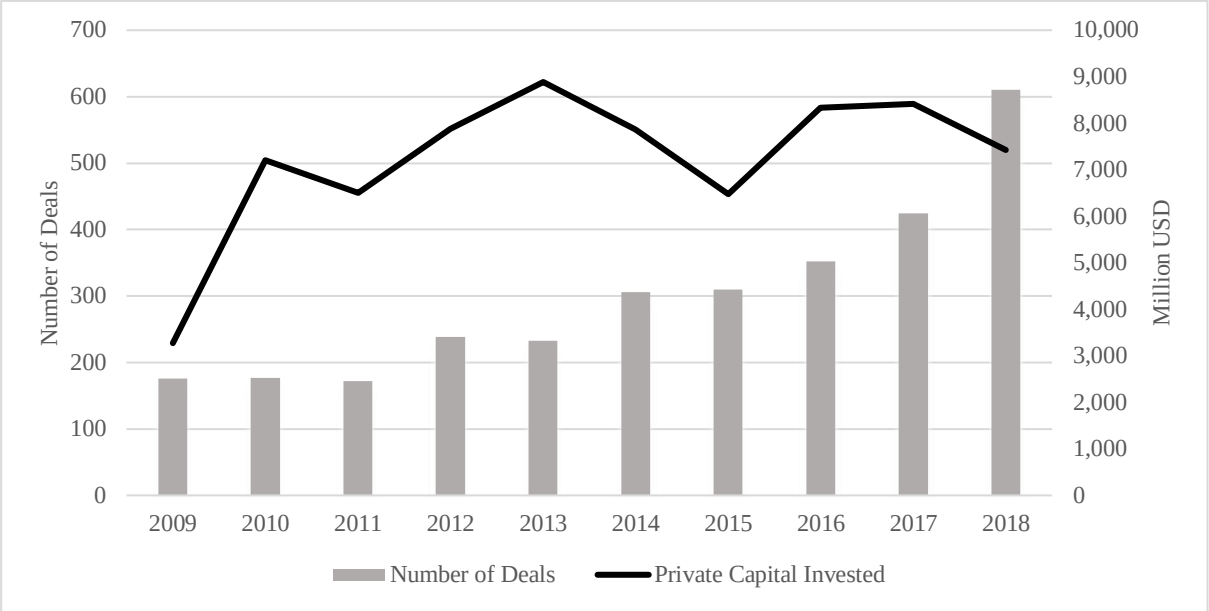
the total size of the industry or deal values. Second, I use two additional PE dummy variables to indicate whether an industry is a high (PE_5High) or low (PE_5Low) PE industry. A high PE industry is an industry in which the share of total private capital investments divided by industry value added is higher than the median (conditional on having a PE investment in this industry). In contrast, a low PE industry has a ratio of PE investments to industry value added below the median. Unlike Bernstein et al. (2017) that deploy total production data from the OECD STAN database to normalize the PE investments, I use industry value added data from the national accounts of the different national statistical institutes or central banks in Latin America[2] due to data availability. As the different national accounts use their own industry classification, I map the industry value added data into the ICB. Subsequently, I convert the industry values added to USD, using average yearly exchange rates from the OECD National Account Statistics (OECD, 2019). Third, to better gauge the impact of different PE activity levels, I create four additional dummy variables that divide the PE activity into quartiles ($PE_5Q1\text{-}4$), following the same approach as for the high and low dummy variables. For both the high-low and the quartile dummy variables, the base category is an industry with no PE investments. See Table A1 in the Annex for a detailed description of the PE variables.

As the compiled LAVCA data represents a novel and unexplored dataset, I present some basic descriptive analyses in the following.

Figure 1 shows that the number of PE deals in Latin America has risen steadily since the global financial crisis. On the other hand, the amount of private capital invested has only grown until 2013 and then stagnated over the last five years, indicating a decrease in the average deal size over time.

[2] In detail, the data was retrieved from Instituto Nacional de Estadística y Censos de la República Argentina (INDEC, 2019), Instituto Brasileiro de Geografia e Estatística (IBGE, 2019), Banco Central de Chile (Banco Central de Chile, 2019), Departamento Administrativo Nacional de Estadística (DANE, 2019), Instituto Nacional de Estadística y Geografía (INEGI, 2019), Instituto Nacional de Estadística e Informática (INEI, 2019).

Figure 1: PE Investments in Latin America, 2009-2018



Notes. This figure plots the total number of PE deals and the total amount of private capital invested in six Latin American countries between 2009 and 2018. PE capital is displayed in USD million.

Table 1 presents the distribution of PE deals by industry. Regarding the number of deals, almost half of PE investments are realized in the Technology industry. Moreover, this industry has shown constant growth in PE investments with a compound annual growth rate (CAGR) of 34% over the last ten years. Regarding deal values, the distribution of PE deals is more dispersed with an increased concentration in traditional buyout industries such as Utilities, Industrials, and Consumer Goods & Services.

Table 1: PE Investments in Latin America by Industry, 2009-2018

Industries	Private Capital Invested (in USD Million)	%	Number of Deals	%
Basic Materials	1,384	2%	40	1%
Consumer Goods & Services	9,992	14%	389	13%
Financials	4,643	6%	187	6%
Health Care	5,196	7%	167	6%
Industrials	9,916	14%	261	9%
Oil & Gas	4,059	6%	37	1%
Technology	8,319	12%	1,419	47%
Telecommunication	2,888	4%	49	2%
Utilities	11,754	16%	247	8%
Other	14,114	20%	202	7%
Total	72,266	100%	2,998	100%

Notes. This table shows the distribution of the total number of PE deals and the total amount of private capital invested across nine industries in Latin American between 2009 and 2018. Industry classifications are at the ICB industry level. The Consumer Goods and Consumer Services industries are merged for industry matching purposes. PE capital is displayed in USD million.

Table 2 shows the large concentration of PE investments in Brazil and to a lesser extent in Mexico, regarding both the number of deals and deal volumes. Regarding the development over time, Mexico has shown the strongest growth in PE investments in terms of the number

of deals with a CAGR of 19%, while Chile has shown the strongest growth in deal volume with a CAGR of 20% over the last ten years.

Table 2: PE Investments in Latin America by Country, 2009-2018

Country	Private Capital Invested (in USD Million)	%	Number of Deals	%
Argentina	1,546	2%	127	4%
Brazil	42,977	59%	1,440	48%
Chile	4,243	6%	240	8%
Colombia	5,663	8%	230	8%
Mexico	11,083	15%	631	21%
Peru	2,291	3%	111	4%
Other Countries	4,462	6%	219	7%
Total	72,266	100%	2,998	100%

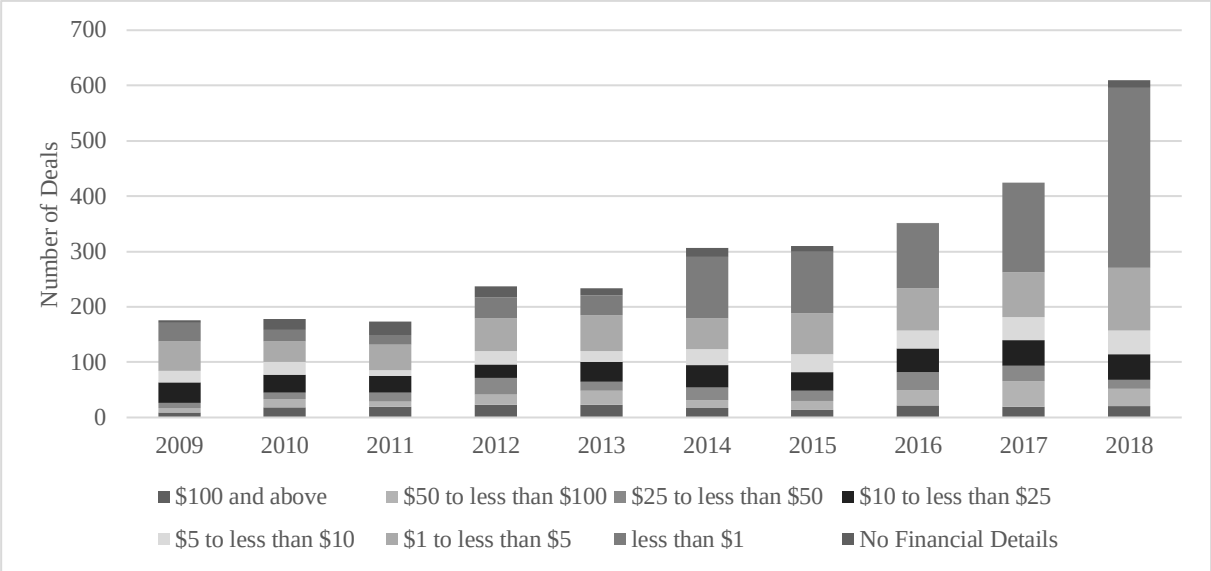
Notes. This table shows the distribution of the total number of PE deals and the total amount of private capital invested across countries in Latin American between 2009 and 2018. The Other Countries category contains the aggregated numbers of all other Latin American countries that are not shown individually. PE capital is displayed in USD million.

Apart from the distribution of PE investments across years, industries, and countries, the LAVCA data contains more detailed information about transaction size and investment stage of PE investments in Latin America. As this data is not disclosed in combination with the industry information, it cannot be used in the subsequent industry analysis in Section 5. However, I shortly present it in the following to gain a better understanding of the nature and development of PE investments in Latin America.

Regarding the distribution of transaction sizes in Figure 2, there is a large concentration of deals with transaction values of up to USD 5 million. Especially deals with investment amounts of less than USD 1 million have risen sharply over the last years. However, these transactions represent only 0.6% of the total capital invested, whereas deals with transaction values above USD 25 million constitute 86% of total capital investments. The average transaction size amounts to USD 25.4 million.

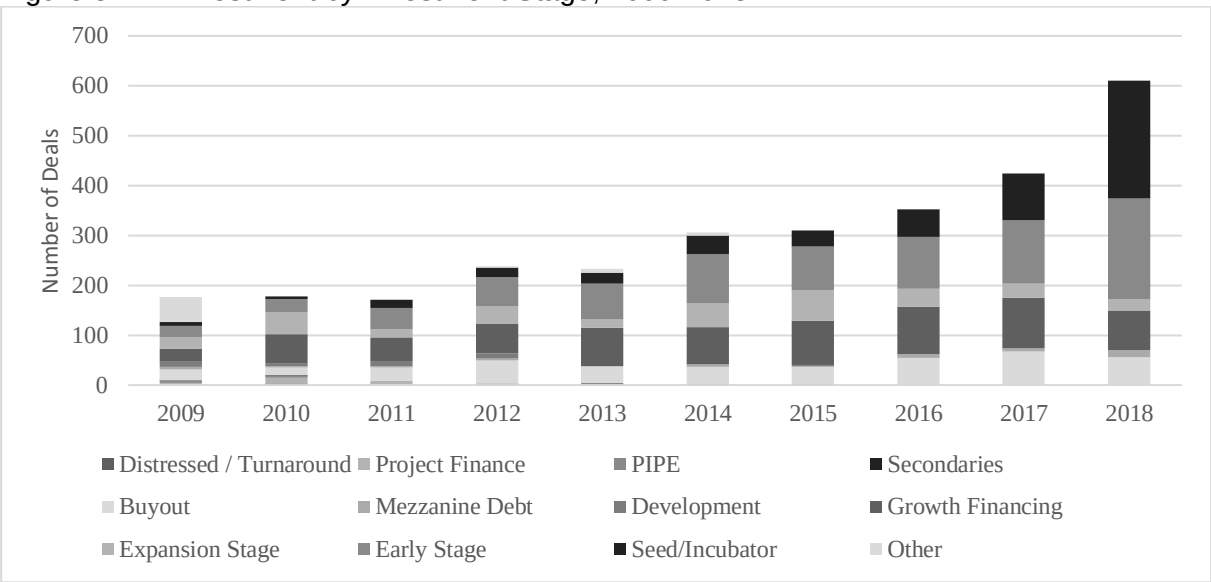
Similarly, Figure 3 shows the large concentration of deals in VC-related investments that account for approx. 84% of all investments over the last ten years. Notably, the Early Stage and Seed/Incubator financing have increased sharply in recent years, accounting for 72% of total deals in 2018. Yet again, regarding deal values, these two categories represent only 3.3% of the total capital invested, whereas growth financing and buyouts represent 44.4% and 37.6%, respectively.

Figure 2: PE Investments in Latin America by Transaction Size, 2009-2018



Notes. This figure plots the total number of PE deals across different transaction size ranges in Latin American between 2009 and 2018. PE size ranges are displayed in USD million.

Figure 3: PE Investment by Investment Stage, 2009-2018



Notes. This figure plots the total number of PE deals across investment stages in Latin American between 2009 and 2018. The investment stage classification comes from LAVCA.

Concerning the construction of the dummy variables, the large concentration of VC-related investments suggests that the dummy variable indicating the presence of a PE investment in a given country-industry will be related more to VC investments. Moreover, due to their reduced transaction sizes, these VC investments might be captured to a larger extent by the first quartile (*PE_5Q1*) and low (*PE_5Low*) PE industries. In contrast, the impact of later-stage investments such as buyout capital with larger deal volumes is probably captured to a higher degree by the high (*PE_5High*) and fourth quartile (*PE_5Q4*) PE industry dummies.

However, there is no direct connection between the two different investment types and the level of PE activity, as the different PE industry dummy specifications regard aggregated deal amounts normalized by industry size.

3.2 Industry Performance Data

The industry performance data comes from DataStream's Global Equity Indices, which provides historical market price and accounting data for more than 340,000 equity indices, including comprehensive coverage of market indices for industries in 68 countries that are classified using the ICB classification. The industry equity indices are computed based on the financial statement information of public companies that comprise at least 75% of the total market capitalization in a given country-industry. The equity indices data was downloaded for the broad industry classification level, which contains ten different industries. Summary statistics for the industry performance variables are presented in Table 3. A detailed description of the industry performance variables is shown in Table A1 in the Annex. Due to the matching problems described in Section 3.1, I again merge the Consumer Goods and Consumer Services industries. I combine free cash flow, net debt, sales, and employee number data by simple addition while I compute total return and net profit margin data using weighted averages based on the market value of equity and sales, respectively. Additionally, I winsorize all industry variables at the 5% and 95% percentile to mitigate the impact of spurious outliers.

Table 3: Summary Statistics of Industry Performance Variables

Industry Performance Variables	Obs.	Mean	Median	Std. Dev.
Employment Growth	221	0.023	0.011	0.056
Labor Productivity Growth	210	-0.014	-0.016	0.180
Profitability Growth	232	-0.005	0.025	0.588
Free Cash Flow Growth	232	0.011	0.012	0.515
Capex Growth	232	-0.023	-0.035	0.287
Industry Return Growth	241	-0.041	-0.030	0.336
Net Debt Growth	232	0.082	0.037	0.389

Notes. This table shows the summary statistics of the industry performance variables. The sample consists of 270 country-industry-year observations of Latin American countries between 2014 and 2018. "Obs." is the number of country-industry-year observations of the different industry performance variables.

One of the concerns regarding the industry variables is the large number of missing values for the Technology and Health Care industry in some countries. However, the dataset contains detailed data for Chile and Brazil, which represent 68.4% of total deals and 78.3% of total deal volume in the Technology industry, and detailed data for the Health Care industry for Brazil, Mexico, and Chile, constituting together 88.1% of deals and 98.2% of deal volume in this industry. Nevertheless, to check the robustness of the results in Section 5, I perform the

analysis with and without both industries. Another concern is the large number of constant employee numbers in the DataStream data that result in zero employment growth. As these observations would cause substantial measurement errors, I exclude the observations with constant employment values from the analysis.

Moreover, as this paper analyzes the spillovers from PE-backed firms to publicly listed peers and not to the whole industry as, e.g., done by Bernstein et al. (2017), it is interesting to examine the share of publicly listed companies as a percentage of the total industry to determine the meaningfulness of the subsequent analysis results for the overall industry.

Table 4: Total Value of Stocks Traded to GDP in Latin America, 2009-2018

Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Argentina	0%	1%	0%	0%	0%	1%	0%	1%	1%	1%
Brazil	42%	41%	32%	34%	30%	26%	23%	31%	31%	41%
Chile	21%	27%	20%	17%	15%	10%	8%	10%	14%	15%
Colombia	9%	8%	8%	9%	5%	5%	4%	5%	4%	4%
Mexico	9%	11%	8%	10%	13%	10%	9%	10%	9%	8%
Peru	2%	3%	3%	3%	2%	2%	1%	1%	3%	1%

Notes. This table shows the ratio of the total value of stocks traded to GDP for six Latin American countries between 2009 and 2018. The information was retrieved from the World Bank (2019).

As shown in Table 4, only Brazil, Chile, and Mexico show more developed equity markets, whereas Argentina, Peru, and Colombia depict a rather small representation of stocks traded in the overall economy. This suggests that the analysis results will be more indicative of spillover effects to public peers and less informative for spillover effects to the whole industry in these countries.

Table 5: Market Value of Stocks per Industry Value Added in Latin America, 2009-2018

Industries	Argentina	Brazil	Chile	Colombia	Mexico	Peru	Total
Basic Materials	17%	167%	72%	3%	84%	115%	75%
Consumer Goods & Services	3%	29%	57%	11%	36%	14%	25%
Financials	19%	104%	353%	189%	32%	175%	145%
Health Care		5%	25%	1%	6%		10%
Industrials	1%	6%	11%	20%	23%	12%	12%
Oil & Gas	89%	287%	718%	305%	2%	5%	274%
Technology		5%	65%	1%			27%
Telecommunication	39%	154%	83%	28%	298%	134%	125%
Utilities	48%	238%	707%	181%	27%	171%	247%
Total	31%	111%	232%	82%	73%	89%	109%

Notes. This table shows the averaged ratio of the market value of stocks to the industry added value for the nine ICB industries in Latin America between 2009 and 2018. The market value data stems from DataStream's Global Equity Indices. The industry added value data comes from the national statistical institutes in Latin America.

Similarly, Table 5 shows the unweighted average of industry market value per industry added value based on data provided by DataStream's Global Equity Indices and the National Statistical Institutes. Especially, Oil & Gas, Utilities, Financials, and Telecommunication show high average shares of stocks traded to industry added value while Health Care and Industrials show rather small participations.

4 Methodology

This paper mainly follows the research approach of Bernstein et al. (2017), who also analyze the impact of PE on industry performance for a set of 20 industries in 25 OECD countries.

First, I perform a univariate analysis, comparing the growth of the different industry variables of PE and non-PE industries, as defined in Section 3. To check if there are significant differences between the growth rates of the two subgroups, I perform a mean equality test for the different industry performance variables. In addition to Bernstein et al. (2017), I perform a variance equality test to check if there are significant differences regarding the variability of growth rates.

As this basic comparison does not control for country, industry, and year effects, I estimate several multivariate specifications. First, I include a PE industry indicator (PE_5) to signal simply the presence of a PE investment in any of the previous five years. Second, I include two indicators that show whether an industry is a high (PE_5High) or low (PE_5Low) PE industry measured by the aggregated PE investments to industry value added ratio being above or below the median. As explained in Section 3, unlike Bernstein et al. (2017) that use total production data to normalize the PE investments, I apply value added data due to its availability in the Latin American national accounts. Third, I estimate another model specification containing PE dummies that divide the activity levels into quartiles ($PE_5Q1\text{-}4$). The omitted category in the second and third model specification is an industry-country with no PE activity. Therefore, the coefficients can be interpreted relative to country-industry-year observations with no PE investments. To control for heterogeneity across industries and countries, country-industry and industry-year fixed effects are included in all model specifications. The resulting fixed effect panel regression is:

$$y_{cit} = PE_{cit}\beta + \mu_{ci} + \tau_{it} + \varepsilon_{cit}$$

where y_{cit} is the dependent variable, i.e., the industry performance variable of interest in country *c,* industry *i* and year *t*, PE_{cit} is a dummy variable indicating if a given industry *i* in

country *c* and year *t* is a PE industry, μ_{ci} is a country-industry fixed effect, τ_{it} is an industry-year fixed effect and ε_{cit} is the error term.

A general concern regarding this panel analysis is the existence of reverse causality. In other words, does the presence of PE investments cause higher industry performance growth, or are PE investments directed into industries where higher performance growth is anticipated? This problem is already partially mitigated by the definition of the PE variables used in this analysis, which considers PE investments of up to five years before the observed industry performance variable growth.

To further address this issue, I change the definition of the PE variables to exclude the PE investments in the previous year, only considering PE investments conducted two to five years before the observation, which is called the twice-lagged PE measure ($PE_{5\text{-}2}$). The basic and twice-lagged PE industry definitions are demonstrated in Figure 4. Therefore, PE investors would be highly foresighted to anticipate industry performance growth two years into the future. Additionally, a growth-anticipation strategy does not result in higher returns for PE investors if industry performance growth is already anticipated by the market and thus incorporated in the transaction price. Only if PE investors better anticipate industry performance growth than other market participants, this investment strategy can generate abnormal returns.

Figure 4: Definition of PE Variables

Notes. This figure visualizes the definition of the basic and twice-lagged PE industries. The blue-colored fields indicate that a given year with reference to the year of observation (t=0) is included in the PE industry definition.

Moreover, as outlined in Section 3, I perform different robustness checks to control for structural changes in the results due to missing or insufficient data.

5 Results

In the following, I first present the results of the univariate analysis and second the results of the different panel model specifications.

5.1 Univariate Analysis

Table 6 presents a univariate comparison of the aggregate growth rates between PE and non-PE industries. Panel A shows that for the basic PE industry definition (PE_5), PE industries grow quicker in terms of employment, labor productivity, profitability, and free cash flow but show lower growth rates for capital expenditures, industry returns, and net debt. However, the p-values reported in column 10 of Panel A show that there are no significant differences between the growth rates in PE and non-PE industries for the basic PE definition. This changes for the twice-lagged PE industry definition (PE_{5-2}) in Panel B for which employment grows 1.9% faster (significant at the 5% significance level) in PE industries as compared to non-PE industries.

Table 6: Industry Growth Variables (PE vs. Non-PE Industries)

	1	2	3	4	5	6	7	8	9	10	11
Panel A: PE Activity (PE_5)											
	All Industries			PE_5 Industry			Non-PE_5 Industry			p-values	
	Obs.	Average Growth	Std. Dev.	Obs.	Average Growth	Std. Dev	Obs.	Average Growth	Std. Dev	μ	σ
Employment	221	0.023	0.06	196	0.024	0.06	25	0.011	0.05	0.18	0.20
Labor Productivity	210	-0.014	0.18	185	-0.014	0.18	25	-0.015	0.16	0.98	0.38
Profitability	232	-0.005	0.59	193	0.008	0.57	39	-0.073	0.67	0.48	0.18
Free Cash Flow	232	0.011	0.52	193	0.025	0.50	39	-0.059	0.60	0.42	0.12
Capex	232	-0.023	0.29	193	-0.025	0.29	39	-0.015	0.28	0.84	0.80
Industry Return	241	-0.041	0.34	202	-0.043	0.33	39	-0.028	0.38	0.82	0.19
Net Debt	232	0.082	0.39	193	0.077	0.38	39	0.105	0.42	0.70	0.45
Panel B: Twice-Lagged PE Activity (PE_{5-2})											
	All Industries			PE Industry			Non-PE Industry			p-values	
	Obs.	Average Growth	Std. Dev	Obs.	Average Growth	Std. Dev	Obs.	Average Growth	Std. Dev.	μ	σ
Employment	221	0.023	0.06	184	0.026	0.06	37	0.007	0.04	0.02	0.01
Labor Productivity	210	-0.014	0.18	174	-0.020	0.18	36	0.014	0.17	0.28	0.63
Profitability	232	-0.005	0.59	181	-0.010	0.56	51	0.012	0.67	0.83	0.10
Free Cash Flow	232	0.011	0.52	181	0.013	0.49	51	0.001	0.59	0.89	0.09
Capex	232	-0.023	0.29	181	-0.028	0.29	51	-0.005	0.27	0.59	0.48
Industry Return	241	-0.041	0.34	190	-0.043	0.32	51	-0.034	0.40	0.89	0.02
Net Debt	232	0.082	0.39	181	0.075	0.38	51	0.108	0.41	0.61	0.50

Notes. The table presents the results of a univariate comparison of industry growth rates between PE and non-PE industries. The sample consists of 270 country-industry-year observations of six Latin American countries between 2014 and 2018. Panel A shows the results for the basic PE industry (PE_5), which is defined as an industry with at least one PE investment in the previous five years. Panel B shows the results for the twice-lagged PE industry (PE_{5-2}), which is defined as an industry with at least one PE investment two to five years before the observation. Columns 10 and 11 provide the p-value of a test of equality of means and variances between PE and non-PE industries.

Regarding the variability of industry growth rates, the reported p-values in column 11 of Panel A show that there are no significant differences between the volatility of the growth rates in PE and non-PE industries. However, regarding the twice-lagged PE industries in Panel B, employment growth shows increased volatility while industry return growth depicts reduced volatility (both significant at the 5% significance level). Moreover, profitability and free cash flow growth show reduced volatility (significant at the 10% significance level).

Table 7 shows a univariate comparison of the aggregate growth rates between high and low PE industries, as defined in Section 3. The reported p-values in column 10 indicate that there are no significant differences between high and low PE industries. Regarding the differences in volatility between high and low PE industries, employment growth depicts higher volatility in high PE industries, as compared to low PE industries whereas free cashflow shows reduced volatility (significant at the 1% significance level). Moreover, labor productivity and profitability show reduced volatility in high PE industries (significant at the 10% significance level) as compared to low PE industries.

Table 7: Industry Growth Variables (High vs. Low PE Industries)

	1	2	3	4	5	6	7	8	9	10	11
	All Industries			PE_5 High Industry			PE_5 Low Industry			p-values	
	Obs.	Average Growth	Std. Dev.	Obs.	Average Growth	Std. Dev.	Obs.	Average Growth	Std. Dev.	μ	σ
Employment	221	0.023	0.06	77	0.031	0.07	86	0.020	0.04	0.22	0.00
Labor Productivity	210	-0.014	0.18	76	-0.033	0.21	78	0.000	0.17	0.28	0.09
Profitability	232	-0.005	0.59	84	-0.052	0.61	74	-0.010	0.50	0.63	0.08
Free Cash Flow	232	0.011	0.52	84	0.049	0.44	74	-0.035	0.60	0.32	0.01
Capex	232	-0.023	0.29	84	-0.032	0.30	74	-0.011	0.29	0.65	0.74
Industry Return	241	-0.041	0.34	86	-0.069	0.37	77	-0.043	0.31	0.63	0.14
Net Debt	232	0.082	0.39	84	0.107	0.40	74	0.101	0.37	0.92	0.51

Notes. The table presents the results of a univariate comparison of industry growth rates between high and low PE industries. The sample consists of 270 country-industry-year observations of six Latin American countries between 2014 and 2018. A high PE industry (*PE_5High*) is defined as a PE industry (*PE_5*) in which the ratio of USD PE investments to industry value added is higher than the median. A low PE industry (*PE_5Low*) is defined as a PE industry (*PE_5*) in which the ratio of USD PE investments to industry value added is below the median. Columns 10 and 11 provide the p-value of a test of equality of means and variances of high and low PE industries.

5.2 Panel Analysis

As the univariate comparisons do not control for country, industry, or year effects, I include country-industry and industry-year fixed effects in different panel model specifications.

Table 8 shows that PE activity has no significant impact on the growth rates of employment for the basic PE industry definition shown in columns 1-3. However, the

regression results for the twice-lagged PE industry definition reported in columns 4-6 indicate a positive impact on employment growth rates, which is in line with the existing literature. The coefficient reported in column 4 shows that employment grows 3.2% (significant at the 1% significance level) faster in twice-lagged PE industries as compared to non-PE industries on average. Moreover, the results in column 5 show that high and low twice-lagged PE industries have similar impacts on the growth rates of employment. While employment grows 3.7% faster (significant at the 10% significance level) in twice-lagged high PE industries as opposed to non-PE industries, it grows 3.6% faster (significant at the 1% significance level) in twice-lagged low PE industries. Similarly, while all the coefficients reported in column 6 are positive (and only one is not statistically significant), there is no clear monotonic increase in the coefficients, moving from Q1 to Q4 twice-lagged PE industries. As only the results for the twice-lagged PE definition are statistically significant, it is unlikely that the results are driven by reverse causality. Moreover, the results in Table 8 suggest that PE investments only have a positive impact on the employment growth of industry peers after one year. This might suggest creative job destruction processes at the industry level in which employment is reduced in the first year following PE investments to allow for higher job creation in the subsequent periods. This would be in line with creative job destruction processes at the target firm level, as outlined by Cressy et al. (2007) and Davis et al. (2008).

Table 8: PE Activity and Growth Rate of Employment

	1	2	3	4	5	6
	PE Activity (PE_5)			Twice-Lagged PE Activity (PE_{5-2})		
PE_5	0.023			0.032***		
	(0.017)			(0.012)		
PE_5Low		0.015			0.036***	
		(0.012)			(0.013)	
PE_5High		0.020			0.037*	
		(0.021)			(0.020)	
PE_5Q1			0.024			0.037**
			(0.023)			(0.016)
PE_5Q2			0.029			0.036**
			(0.023)			(0.017)
PE_5Q3			0.014			0.042*
			(0.022)			(0.022)
PE_5Q4			0.018			0.024
			(0.026)			(0.021)
Observations	221	186	186	221	186	186
R-Squared	0.011	0.008	0.017	0.032	0.048	0.054

Notes: The table contains the results of an OLS panel regression for country-industry-year observations in Latin America between 2014 and 2018. The dependent variable is the growth rate of employment. The independent variables are an indicator signaling PE investments in the previous five years in a country-industry (PE_5), indicators signaling if the PE activity in a country-industry is above or below the median PE activity (PE_5Low and PE_5High), and indicators dividing the PE activity in into quartiles (PE_5Q1-$Q4$). Columns 1-3 show the basic PE industry indicators, including PE investments in the five years before the observation. Columns 4-6 show the twice-lagged PE industry indicators that only include PE investments two to five years before the observation. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

In general, the results in Table 8 contrast with the public concerns that PE investments generate job losses at the industry level as all reported coefficients show a positive impact on employment growth.

Table 9 considers the impact of PE investments on the growth rates of labor productivity. The results in column 1-3 suggest that PE investments have no significant impact on the labor productivity growth of industry peers for the basic PE definition. However, the results for the twice-lagged PE industries in columns 4-6 indicate that PE investments have a negative impact on the labor productivity of industry peers. The coefficient in column 4 shows that twice-lagged PE industries grow 12.2% slower (significant at the 1% significance level) than non-PE industries on average. Moreover, the results in column 5 show that twice-lagged low PE industries have a stronger negative impact on labor productivity growth than twice-lagged high PE industries. Twice-lagged low PE industries grow 15% slower (significant at the 1% significance level) in terms of labor productivity than non-PE industries, whereas twice-lagged high PE industries reduce labor productivity growth rates by 12.4% (significant at the 1% significance level). Moreover, although all the coefficients in column 6 show a significantly negative impact on industry growth rates, there is no clear monotonic increase in the magnitude of the coefficients, moving from Q1 to Q4 twice-lagged PE industries. As again only the results for the twice-lagged PE industry definition are statistically significant, and all the reported coefficients show a negative impact on industry growth rates, it is unlikely that results are driven by investors entering industries with higher anticipated growth. Moreover, the results in Table 9 suggest that industry spillover effects need a certain period to materialize, similar to the spillover effects detected for employment growth in Table 8. The findings might indicate that target firms drive demand and sales away from competitors that turn less competitive after the operational improvements start to be implemented at target firms after the first years following the investment. However, it remains unclear why employment grows faster while labor productivity grows slower in twice-lagged PE industries. Typically, it would be expected that reduced labor productivity growth results in reduced employment growth. Moreover, the results contrast with the results obtained by Aldatmaz & Brown (2013), who find an increase in labor productivity for public industry rivals following PE investments consistent with the idea that operational improvements at target firms spill over to industry peers. A possible explanation for the conflicting results in this paper might be that industry peers are forced to hire more staff to keep pace with the changes implemented at target firms. However, the additional engagements might not lead to (sufficiently) increased sales as private-equity backed firms might hire or operate more efficiently than their domestic industry peers.

Table 9: PE Activity and Growth Rate of Labor Productivity

	1	2	3	4	5	6
	PE Activity (PE_5)			Twice-Lagged PE Activity (PE_{5-2})		
PE_5	-0.058			-0.122***		
	(0.056)			(0.041)		
PE_5Low		-0.021			-0.150***	
		(0.067)			(0.050)	
PE_5High		-0.038			-0.124***	
		(0.061)			(0.044)	
PE_5Q1			-0.042			-0.115*
			(0.096)			(0.065)
PE_5Q2			-0.036			-0.191***
			(0.079)			(0.048)
PE_5Q3			-0.021			-0.146***
			(0.053)			(0.039)
PE_5Q4			-0.062			-0.144***
			(0.072)			(0.055)
Observations	210	177	177	210	177	177
R-Squared	0.004	0.002	0.005	0.028	0.041	0.046

Notes: The table contains the results of an OLS panel regression for country-industry-year observations in Latin America between 2014 and 2018. The dependent variable is the growth rate of labor productivity. The independent variables are an indicator signaling PE investments in the previous five years in a country-industry (PE_5), indicators signaling if the PE activity in a country-industry is above or below the median PE activity (PE_5Low and PE_5High), and indicators dividing the PE activity in into quartiles (PE_5Q1-$Q4$). Columns 1-3 show the basic PE industry indicators, including PE investments in the five years before the observation. Columns 4-6 show the twice-lagged PE industry indicators that only include PE investments two to five years before the observation. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 10: PE Activity and Growth Rate of Profitability

	1	2	3	4	5	6
	PE Activity (PE_5)			Twice-Lagged PE Activity (PE_{5-2})		
PE_5	-0.010			-0.149		
	(0.154)			(0.199)		
PE_5Low		0.000			-0.121	
		(0.173)			(0.204)	
PE_5High		0.333			-0.227	
		(0.265)			(0.239)	
PE_5Q1			-0.104			-0.252
			(0.164)			(0.160)
PE_5Q2			0.149			0.004
			(0.215)			(0.300)
PE_5Q3			0.143			-0.196
			(0.153)			(0.279)
PE_5Q4			0.058			-0.088
			(0.202)			(0.340)
Observations	232	193	193	232	193	193
R-Squared	0.000	0.021	0.010	0.004	0.008	0.014

Notes: The table contains the results of an OLS panel regression for country-industry-year observations in Latin America between 2014 and 2018. The dependent variable is the growth rate of profitability. The independent variables are an indicator signaling PE investments in the previous five years in a country-industry (PE_5), indicators signaling if the PE activity in a country-industry is above or below the median PE activity (PE_5Low and PE_5High), and indicators dividing the PE activity in into quartiles (PE_5Q1-$Q4$). Columns 1-3 show the basic PE industry indicators, including PE investments in the five years before the observation. Columns 4-6 show the twice-lagged PE industry indicators that only include PE investments two to five years before the observation. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Regarding profitability, Table 10 suggests that there is no significant impact of PE investments on the growth rates of public industry peers in PE industries as all the reported coefficients are not statistically significant.

However, Table 11 shows that PE activity has a positive impact on the growth rates of free cash flow. The coefficient in column 1 indicates that the free cash flow of peers in PE industries grows 50.2% faster (significant at the 5% significance level) than in non-PE industries. Regarding the coefficients in column 2, high and low PE industries seem to have different impacts on free cash flow growth rates. While free cash flow grows 50.9% faster (significant at the 5% significance level) in high PE industries as opposed to non-PE industries, low PE industries show no statistically significant impact on growth rates. This suggests that the impact on PE industries is mainly driven by industries with a high degree of PE investments. Moreover, all the reported coefficients in column 3 show a positive and significant impact on free cash flow with a monotonic increase in the magnitude of the coefficients, moving from Q1 to Q4 PE industries. This suggests that the impact on free cash flow growth rates increases with the relative level of PE investments in a country-industry. However, as most of the results are not statistically significant for the twice-lagged PE industry definition in columns 4-6, it is hard to refute the possibility of reverse causality for the free cash flow growth effect. Following the free cashflow definition of DataStream, the results in columns 1-3 indicate that industry peers generate more funds from operations following PE investments. As there is no evidence for increased sales due to the negative impact of PE investments on labor productivity growth reported in Table 9, the findings might result from better working capital and general cashflow management or reduced costs. However, reduced cost effects would likely also be reflected in positive profitability growth effects in Table 10, which is not the case, as all the coefficients are not statistically significant. Moreover, the results contrast with the findings from Aldatmatz & Brown (2013), who find no evidence for an impact on free cash flow growth at public industry peers following PE investments. Similarly, I find no significant impact of PE activity on free cash flow growth when I exclude the Health Care and Technology industries from the analysis, suggesting that these two industries drive the positive impact on free cash flow growth. Beyond that, the magnitude of the coefficients in columns 1-3 is surprisingly large, suggesting substantial differences between PE and non-PE investments.

Table 11: PE Activity and Growth Rate of Free Cash Flow

	1	2	3	4	5	6
	PE Activity (PE_5)			Twice-Lagged PE Activity (PE_{5-2})		
PE_5	0.502**			0.060		
	(0.229)			(0.177)		
PE_5Low		-0.015			-0.136	
		(0.343)			(0.224)	
PE_5High		0.509**			0.198	
		(0.224)			(0.195)	
PE_5Q1			0.378**			0.024
			(0.177)			(0.338)
PE_5Q2			0.539**			-0.267*
			(0.214)			(0.147)
PE_5Q3			0.672***			0.214
			(0.215)			(0.164)
PE_5Q4			0.758***			-0.068
			(0.269)			(0.134)
Observations	232	193	193	232	193	193
R-Squared	0.038	0.055	0.061	0.001	0.023	0.040

Notes: The table contains the results of an OLS panel regression for country-industry-year observations in Latin America between 2014 and 2018. The dependent variable is the growth rate of free cash flow. The independent variables are an indicator signaling PE investments in the previous five years in a country-industry (PE_5), indicators signaling if the PE activity in a country-industry is above or below the median PE activity (PE_5Low and PE_5High), and indicators dividing the PE activity in into quartiles (PE_5Q1-$Q4$). Columns 1-3 show the basic PE industry indicators, including PE investments in the five years before the observation. Columns 4-6 show the twice-lagged PE industry indicators that only include PE investments two to five years before the observation. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

An often-mentioned concern regarding PE investments is that short-term profits (or cash flows) might be generated to the detriment of long-term cash flow generation and value creation. Therefore, it is interesting to analyze if capital expenditures are reduced following PE investments, which might indicate that future cash flows are sacrificed for short-term profitability. Table 12 shows that there is no evidence for this hypothesis as all the coefficients in columns 1-3 show a positive impact on capital expenditure growth for public peers following PE investments, which is consistent with the findings of Aldatmaz & Brown (2013). However, only a few coefficients are statistically significant. The coefficient reported in column 1 shows that the basic PE indicator has no significant impact on the growth rates of capital expenditures. Regarding the results of the high and low PE industries shown in column 2, only the low PE industry grows significantly faster with a positive impact of 14.8% (significant at the 1% level) as compared to the non-PE industries. Regarding the quartile PE specifications in column 3, there is a monotonic increase in the coefficients moving from the Q1 to Q4 PE industry specification. However, only the third and fourth quartile PE industries show statistically significant coefficients (significant at the 10% and 5% significance level respectively). In general, the findings regarding capital expenditures are more suggestive but indicate that public industry peers increase their capital expenditures to compete with PE-backed firms in the same country-industry. However, none of the mentioned results in columns 1-3 remain

significant for the twice-lagged PE industry definition. Therefore, it is again hard to refute the possibility of reverse causality.

Table 12: PE Activity and Growth Rate of Capital Expenditures

	1	2	3	4	5	6
	PE Activity (PE_5)			Twice-Lagged PE Activity (PE_{5-2})		
PE_5	0.142			-0.013		
	(0.114)			(0.071)		
PE_5Low		0.148***			0.065	
		(0.054)			(0.096)	
PE_5High		0.006			-0.010	
		(0.084)			(0.092)	
PE_5Q1			0.145			0.089
			(0.130)			(0.082)
PE_5Q2			0.158			0.021
			(0.117)			(0.166)
PE_5Q3			0.167*			-0.068
			(0.097)			(0.126)
PE_5Q4			0.229**			0.057
			(0.107)			(0.124)
Observations	232	193	193	232	193	193
R-Squared	0.011	0.021	0.020	0.000	0.006	0.014

Notes: The table contains the results of an OLS panel regression for country-industry-year observations in Latin America between 2014 and 2018. The dependent variable is the growth rate of free capital expenditures. The independent variables are an indicator signaling PE investments in the previous five years in a country-industry (PE_5), indicators signaling if the PE activity in a country-industry is above or below the median PE activity (PE_5Low and PE_5High), and indicators dividing the PE activity in into quartiles (PE_5Q1-$Q4$). Columns 1-3 show the basic PE industry indicators, including PE investments in the five years before the observation. Columns 4-6 show the twice-lagged PE industry indicators that only include PE investments two to five years before the observation. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Another way to analyze the long-term prospects of industry peers is to look at the growth rates of industry returns. While the existing literature provides evidence for an improved stock market performance of target firms, Table 13 shows a negative impact of PE investments on the industry return growth as all reported coefficients are negative. This is consistent with the findings of Aldatmaz & Brown (2013), who also find a negative impact of PE investments on industry returns for buyout investments. The coefficient reported in column 1 indicates that the returns of public peers grow 39.1% slower (significant at the 1% significance level) in PE industries as opposed to non-PE industries. The coefficients in column 2 show that high PE industries have a slightly less pronounced impact on industry returns than low PE industries. While high PE industries grow 20.3% slower (significant at the 10% significance level) than non-PE industries, low PE industries grow 23.4% slower (significant at the 5% significance level). Similarly, although all the coefficients reported in column 3 are negative and statistically significant at the 5% or 1% significance level, there is no monotonic increase in the coefficients moving from the Q1 to the Q4 PE industry definition. In general, the results suggest that stock markets relate PE activity to reduced competitiveness and long-term cash flow generation capacity of industry peers. This is congruent with the findings of reduced labor productivity

following PE investments in Table 9 and the general notion that PE-backed firms capture larger shares of the total industry demand to the detriment of industry peers. However, the results contrast with the findings in Table 11 that show higher free cashflow growth following PE investments. For the twice-lagged PE definition, most of the results reported in columns 4-6 are not statistically significant, which might indicate reverse causality. Only the coefficients of the second and third quartile PE industry in column 6 show a significant negative impact on industry returns (significant at the 10% significance level). However, it is improbable that results are driven by reverse causality as investors would allocate funds to industries with lower anticipated growth. Nevertheless, PE investors may direct their funds to underperforming industries in which they see large potential for improvements. Beyond that, the large magnitude of the PE impact is again surprising.

Table 13: PE Activity and Growth Rate of Industry Returns

	1	2	3	4	5	6
	PE Activity (PE_5)			Twice-Lagged PE Activity (PE_{5-2})		
PE_5	-0.391***			-0.115		
	(0.081)			(0.105)		
PE_5Low		-0.234**			-0.157	
		(0.112)			(0.121)	
PE_5High		-0.203*			-0.139	
		(0.117)			(0.118)	
PE_5Q1			-0.484***			-0.166
			(0.132)			(0.162)
PE_5Q2			-0.317**			-0.189*
			(0.144)			(0.108)
PE_5Q3			-0.426***			-0.239*
			(0.140)			(0.124)
PE_5Q4			-0.447***			0.052
			(0.116)			(0.108)
Observations	241	198	198	241	198	198
R-Squared	0.052	0.023	0.082	0.007	0.012	0.039

Notes: The table contains the results of an OLS panel regression for country-industry-year observations in Latin America between 2014 and 2018. The dependent variable is the growth rate of industry returns. The independent variables are an indicator signaling PE investments in the previous five years in a country-industry (PE_5), indicators signaling if the PE activity in a country-industry is above or below the median PE activity (PE_5Low and PE_5High), and indicators dividing the PE activity in into quartiles (PE_5Q1-$Q4$). Columns 1-3 show the basic PE industry indicators, including PE investments in the five years before the observation. Columns 4-6 show the twice-lagged PE industry indicators that only include PE investments two to five years before the observation. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Another often-debated topic regarding PE investments is the observed increase in leverage at target firms following PE investments that can lead to increased probabilities of financial distress and bankruptcy. In contrast, Table 14 shows that there is no significant relation between PE activity and the growth rates of net debt at public industry peers as all reported coefficients are not statistically significant. However, the insignificant results regarding the industry leverage might also be driven by the fact that PE (buyout) and VC investments impact leverage levels in very distinct ways. Aldatmatz & Brown (2013) show, for example, that

only buyout capital increases the net debt levels of public industry peers while there is no significant relationship for VC.

Table 14: PE Activity and Growth Rate of Net Debt

	1	2	3	4	5	6
	PE Activity (PE_5)			Twice-Lagged PE Activity (PE_{5-2})		
PE_5	0.052			0.039		
	(0.099)			(0.163)		
PE_5Low		0.065			0.067	
		(0.183)			(0.190)	
PE_5High		-0.051			0.002	
		(0.133)			(0.158)	
PE_5Q1			0.168			0.076
			(0.123)			(0.283)
PE_5Q2			-0.212			0.055
			(0.155)			(0.146)
PE_5Q3			-0.117			-0.006
			(0.120)			(0.157)
PE_5Q4			-0.053			0.002
			(0.181)			(0.150)
Observations	232	193	193	232	193	193
R-Squared	0.001	0.005	0.039	0.001	0.002	0.003

Notes: The table contains the results of an OLS panel regression for country-industry-year observations in Latin America between 2014 and 2018. The dependent variable is the growth rate of net debt. The independent variables are an indicator signaling PE investments in the previous five years in a country-industry (PE_5), indicators signaling if the PE activity in a country-industry is above or below the median PE activity (PE_5Low and PE_5High), and indicators dividing the PE activity in into quartiles (PE_5Q1-$Q4$). Columns 1-3 show the basic PE industry indicators, including PE investments in the five years before the observation. Columns 4-6 show the twice-lagged PE industry indicators that only include PE investments two to five years before the observation. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

As outlined in Section 3 and 4, I perform several robustness checks to control for potential structural changes in the results caused by data insufficiencies. First, all the main results hold when I exclude Chile and Peru from the analysis, which both showed a large percentage of deals classified under the “Other” industry classification. For this robustness check, PE investments also have a positive impact on employment for the basic PE industry definition (PE_5). Second, when I exclude the Health Care and Technology industries from the analysis, the results regarding the free cash flow growth effects are not significant anymore. However, all the other results remain robust. Third, when I repeat the analysis without the fitted values for missing deal amounts, several results of the high and low as well as of the quartile PE industry indicators are not significant anymore. However, as the basic PE indicator is independent of the deal amounts, the main results of this research remain intact. Finally, all results hold for winsorized and non-winsorized variables. Regarding the non-winsorized analysis, the impact of PE investments on employment is again also significant for the basic PE industry definition (PE_5).

6 Conclusion

The growth of the PE industry over the past decades has raised concerns about how PE investments impact overall economic welfare. Especially in the public debate, policymakers and other stakeholders have pointed to numerous case studies showing the harmful industry practices of PE funds such as excessive leverage and large-scale job losses. However, an increasing body of literature indicates the mainly beneficial impacts of PE investments on the performance of investment targets. At the same time, there is little research about the impact of PE investments on industry performance, which relates to the idea that performance changes implemented at PE-backed firms spill over to industry peers, thus affecting the whole industry. While recent studies regarding this topic find evidence for positive industry spillover effects concerning different performance measures, there is no existing research that focuses exclusively on emerging market economies. The analysis of emerging markets is relevant as these markets show different industry dynamics and institutional settings that alter how spillover mechanisms occur. Moreover, the existing literature has mainly focused on the pre-financial crisis period that may not be representative for the past decade due to the massive breakdown of the PE industry after 2008.

Therefore, by using a novel dataset on Latin American PE investments in nine different industries across six countries in the period from 2009 to 2018, this study examines the impact of PE investments on the industry performance in an emerging market and post-financial crisis setting. As this paper focuses on aggregate industry performance measures of public peers, it can clearly identify industry spillovers from target firms to other firms operating in the same domestic industry.

While research focusing on developed markets has mainly found evidence for positive industry impacts, the main results of this paper are mixed. On the one hand, there is evidence that PE investments have a positive impact on employment, capital expenditure, and free cash flow growth of domestic peers, which indicates positive industry spillovers. On the other hand, PE investments seem to negatively impact the growth rates of labor productivity and industry returns, suggesting that target firms drive demand away from industry peers as they turn more competitive following PE investments. Moreover, the results show no clear pattern between increasing levels of PE activity and the magnitude of spillover effects, suggesting that spillover effects can occur independently from the relative level of PE activity. I find no evidence for PE effects on profitability and net debt growth. Regarding reverse causality, this paper provides some suggestive indications that results are driven by PE investments and not by investors allocating funds to industries with anticipated growth. Additionally, the results mainly persist for a variety of robustness checks.

The results indicate that industry dynamics and spillover effects in Latin America are different from the ones observed in developed markets that mainly show positive spillover effects following private investments. A possible explanation for the opposing findings in this paper is that competitive pressures force industry peers in Latin America to adopt changes implemented at target firms that lead to higher employment, free cash flow, and capital expenditure growth. However, as PE-backed firms might outperform their peers in these measures, domestic industry rivals turn less competitive, losing shares of the total industry demand, which is reflected in lower labor productivity and industry return growth. On the other hand, the insignificant or sometimes opposing results may arise from data limitations regarding the lacking distinction between different PE investment types, the rough industry classifications, or the low representation of public firms in Latin American industries, among others.

The findings of this paper contribute to the growing body of literature that analyses how firm performance changes following PE investments. It complements the existing research by providing evidence for industry spillover from PE-backed firms to domestic industry peers in an emerging market environment for the period after 2008. Moreover, it contributes to the general literature regarding industry spillover by providing evidence for a different industry spillover channel other than foreign direct investments of multinational corporations.

Apart from its contribution to the PE literature, this paper also provides insights for economic and financial policymakers in Latin America and other emerging markets on how to efficiently regulate the PE industry by showing the impact of PE investments not only on individual firms but also other firms operating in the same country-industry. In contrast to the negative image of the PE industry in the public discussion, it shows a more ample picture, providing evidence for positive and negative spillovers. Notably, the concerns regarding the adverse impact of PE investments on employment levels are not substantiated by the research results.

However, there remain several areas for future research to more clearly identify the impact of PE investments in Latin America and other emerging market economies. First, it is vital to extend the existing literature regarding the impact of PE investments on target firm performance in developed markets to emerging market settings to understand the investment dynamics in these environments better. Second, it is relevant to extend the research regarding the impact of PE investments on industry performance in emerging markets with more refined data. To start with, it is necessary to analyze the different effects of PE (buyout) and VC investments as both investment types affect target firms and industries in distinct ways. This is especially important as the data in this paper indicates that most reported deals in Latin

America are smaller sized and VC-related, whereas most existing research focuses on buyout capital. Additionally, VC investments have shown steady growth over the last years in Latin America. Moreover, it is relevant to analyze the industry performance effects with more detailed industry classification to be able to identify industry patterns more clearly. Additionally, as public companies represent only a small portion of the overall industry in several Latin American countries, it would be interesting to study the impact of PE on the whole industries, including private and public companies, e.g., with production and employment data provided by the Latin American national statistical institutes. Finally, future research can look at further aspects of industry performance such as wage levels, default probabilities, plant opening and closing, process and product innovation, industry cyclicality, or the distribution of wealth and income. Studying the impact of PE investments on these measures would allow economic policymakers to gain a more ample picture of the economic welfare impacts of PE investments and to regulate these investments more efficiently.

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8 Annex

Table A1: Data Sources and Variable Definition

Panel A: Data Sources	
LAVCA	LAVCA is a non-profit membership organization with the objective to promote private capital investments in Latin America. It provides detailed information about Latin American PE (buyout) and VC fundraising, investments, and exits to its members from primary and secondary sources. LAVCA gathers most of its data through its bi-annual "Fund Manager Survey" on PE (buyout) and VC activity in Latin America that encompasses information from over 400 fund management firms active in Latin America and the Caribbean.
DataStream	DataStream's Global Equity Indices provide aggregated market price and accounting data based on financial statement information of public companies, including market indices for industries in 68 countries that are classified using the ICB classification. The DataStream Global Equity Indices are provided by Refinitiv, one of the world's largest providers of financial markets data and infrastructure.
National Statistical Institutes	The Latin American national statistical institutes are: Instituto Nacional de Estadística y Censos de la República Argentina (Argentina), Instituto Brasileiro de Geografia e Estatística (Brazil), Banco Central de Chile (Chile), Departamento Administrativo Nacional de Estadística (Colombia), Instituto Nacional de Estadística y Geografía (Mexico), Instituto Nacional de Estadística e Informática (Peru).
Panel B: Variable Definition	
PE Industry (PE_5)	Indicator for an industry with at least one PE investment in the previous five years (LAVCA)
High PE Industry (PE_5High)	Indicator for an industry in which the ratio of USD PE investments to industry value added is higher than the median conditional to the presence of a PE investment in that industry (LAVCA, National Statistical Institutes)
Low PE Industry (PE_5Low)	Indicator for an industry in which the ratio of USD PE investments to industry value added is lower than the median conditional to the presence of a PE investment in that industry (LAVCA, National Statistical Institutes)
Q4 PE Industry (PE_5Q4)	Indicator for an industry in which the ratio of USD PE investments to industry value added is higher than the third quartile conditional to the presence of a PE investment in that industry (LAVCA, National Statistical Institutes)
Q3 PE Industry (PE_5Q3)	Indicator for an industry in which the ratio of USD PE investments to industry value added is higher than the second and equal or lower to the third quartile conditional to the presence of a PE investment in that industry (LAVCA, National Statistical Institutes)
Q2 PE Industry (PE_5Q2)	Indicator for an industry in which the ratio of USD PE investments to industry value added is higher than the first and equal or lower to the second quartile conditional to the presence of a PE investment in that industry (LAVCA, National Statistical Institutes)
Q1 PE Industry (PE_5Q1)	Indicator for an industry in which the ratio of USD PE investments to industry value added is equal or lower than the first quartile conditional to the presence of a PE investment in that industry (LAVCA, National Statistical Institutes)
Employment Growth	Log difference in employee numbers between time t and t-1 (DataStream)
Profitability Growth	Log difference in profit margins between time t and t-1 (DataStream)
Labor Productivity Growth	Log difference in sales per number of employees between time t and t-1 (DataStream)
Capex Growth	Log difference in capital expenditures between time t and t-1 (DataStream)

Cash Flow Growth	Log difference in free cash flow between time t and t-1 (DataStream)
Net Debt Growth	Log difference in debt net of cash and cash equivalents between time t and t-1 (DataStream)
Industry Return Growth	Log difference in the value of the total return index provided by DataStream's Global Equity Indices between time t and t-1 (DataStream)