The Real Effects of Private Equity Buyouts: A Meta-Analysis

Jeroen Verbouw
Ghent University

Miguel Meuleman
Vlerick Business School and Ghent University

Sophie Manigart
Vlerick Business School and Ghent University

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ABSTRACT

Using a meta-analytical approach, this study reviews the fragmented and contradictory empirical literature on the real effects of private equity (PE) on their portfolio companies, focusing on post-buyout operating performance and employment. Based upon 330 samples including 403,820 firms, we find a positive PE effect on operating performance in the medium-to-long term, but no effect on employment. Interestingly, performance gains are stronger in private-to-private buyouts compared to public-to-private buyouts. Countries with strong investor protection laws or with individualistic cultures facilitate larger operating performance gains, while employees are better off in countries with more stringent employee protection laws or with collectivistic cultures.

Keywords: private equity, real effects, operating performance, employment, meta-analysis

1 Introduction

Private equity (PE) investments are equity investments by financial intermediaries in mature, private companies, including public-to-private (PTP) and private-to-private transactions, and are typically referred to as (leveraged) buyouts.[1] Given its importance – total PE deal value amounted to $551 billion in 2019 (Bain & Company, 2020) – the impact of PE on portfolio companies and their stakeholders receives considerable attention from academics, practitioners, and policy makers. For example, Elisabeth Warren, a former U.S. democratic presidential candidate, accused the PE industry of looting when introducing her 'Stop Wall Street Looting Act'.[2] She argued that PE investors burden their portfolio companies with an unmanageable amount of debt and hereby do not care for employment consequences. Reports sponsored by the PE industry itself, on the other hand, indicate in general a positive picture of the real effects of PE (e.g., Frontier Economics, 2013; NVCA and Invest Europe's websites).

Academic evidence specifies three fundamental drivers of post-buyout shareholder value generation: (i) creating value through operational and governance enhancement, (ii) transferring value from pre-buyout stakeholders such as employees, customers and suppliers and (iii) capturing value through financial engineering (Castellaneta, Hannus, & Wright, 2019). While literature on shareholder value creation is unanimously positive, it is, however, less clear through which of these three channels value is created. Empirical support is largely found for the financial engineering channel (Kaplan & Strömberg, 2009), raising the question what the real effects of PE are and whether they are obtained through operational and governance enhancements, implying PE creates economic value, or merely through value transfers. A considerable body of research focusses on disentangling both effects, but remains inconclusive.

[1] We hereby explicitly exclude venture capital investments in young, high growth oriented companies.
[2] https://www.warren.senate.gov/imo/media/doc/2019.7.17%20Stop%20Wall%20Street%20Looting%20Act%20One%20Pager.pdf

While some studies report a positive impact of PE on growth (e.g., Cohn, Hotchkiss, & Towery, 2020; Jelic, Zhou, & Wright, 2019), operational efficiency (Alperovych, Amess, & Wright, 2013; Meuleman, Amess, Wright, & Scholes, 2009) and employment (e.g., Amess & Wright, 2012; Paglia & Harjoto, 2014), others report negative impacts (e.g., Antoni, Maug, & Obernberger, 2019; Cressy, Munari, & Malipiero, 2011). The controversy on the impact of PE, both in society and in academia, therefore warrants a thorough analysis, but has – to the best of our knowledge – not yet been quantitatively reviewed.

The goal of the present research is to estimate the direct effect of PE on portfolio companies, and moderators thereof, through a meta-analysis. More specifically, we address the following research questions: (i) what is the impact of PE on operating performance and employment, and (ii) how do these relationships vary under the presence of boundary conditions. Meta-analyses have been used in entrepreneurship and entrepreneurial finance literature (see for instance Rosenbusch, Brinckmann, & Müller, 2013; Schommer, Richter, & Karna, 2019; Stam, Arzlanian, & Elfring, 2014). Their main aim is to determine the overall effect size of the relationship at study by aggregating effect sizes across samples (Borenstein, Hedges, Higgins, & Rothstein, 2011). Next, they allow to assess and identify moderating effects beyond those included in the underlying studies (Hunter & Schmidt, 2004). As such, by aggregating studies from different institutional frameworks, our meta-analysis enables to uncover the moderating effect of the institutional context.

We aggregate 255 samples studying post-buyout operating performance (326,970 companies) and 75 samples studying post-buyout employment (76,850 companies) from 60 independent empirical studies. While we fail to find a significant effect of PE on employment, the effect on operating performance is significantly positive three to five years after the investment. The substantial heterogeneity found in the samples for both operating performance and employment suggests that there might be important moderators, which distort the overall

effect size. More specifically, we find that private-to-private buyouts show higher operating performance gains compared to PTP buyouts. Next, the regulatory and cultural environment in which PE operates is important, as post-buyout operating performance increases most in countries with strong investor protection laws or with more individualistic cultures. Interestingly, while the average effect of PE on employment is zero, employment increases in countries with strong employment protection laws but decreases in countries with more individualistic cultures.

Our study makes several contributions to the current debate on the real effects of PE. First, we quantitively synthesize its effect on operating performance and employment documented in existing studies. Quantifying the PE effect is important since there is still considerable debate on whether PE (i) enhances portfolio companies' operating performance, (ii) does so by transferring value from employees to investors through layoffs or lower compensations, or (iii) in contrast, invests in the portfolio companies' employment base to enhance productivity and growth.

Second, we document that value creation happens in the medium-to-long term. While immediate layoffs would result in stronger operating performance in the short term – which we fail to find -, strategic repositioning at the beginning of the PE ownership period should only materialise in the medium-to-long term. Value-adding activities such as monitoring, management assistance and enhanced governance should also help support performance in the medium term.

Third, relying on agency theory, we examine to what extent the pre-buyout ownership structure of the portfolio company matters for subsequent value-adding propensities. We expect that companies with high agency conflicts pre-buyout, such as public companies, should benefit most from a PE governance model as PE investors typically focus on mitigating agency costs. Our analysis reveals the opposite, however, with private targets outperforming PTP buyouts.

This hence suggest the presence of other, and more important, drivers of value creation in these buyouts.

Fourth, we analyse how both the formal and informal institutional context in which a PE buyout takes place impacts performance. Although the formal institutional context is commonly believed to matter for value-adding effectiveness (Capron & Guillén, 2009), few studies apply a multi-institutional study design. Aggregating extant empirical work allows to differentiate between PE investments in investor-friendly and employee-friendly institutional frameworks. In contrast, the informal context has not received attention in the PE literature. This is surprising as individualism is related to corporate risk-taking propensity, entrepreneurial orientation and the willingness to lay off employees to enhance profits (Li, Griffin, Yue, & Zhao, 2013; Shane, 1993). Our meta-analysis allows to highlight how the informal institutional context impact PE's impact on targets.

Fifth, the entrepreneurial finance literature is not properly integrated and shows an apparent segmentation between entrepreneurship/management and finance journals (Cumming & Johan, 2017). A final contribution of our analysis is therefore that it interdisciplinary synthesizes empirical findings from both literatures, and by including over 40 years of research, allows for a more holistic view on the real impact of PE.

The next section describes the theoretical framework and presents hypotheses. Section 3 explains the meta-analytical methodology. Section 4 presents the description of the overall effect sizes and sources of heterogeneity, followed by moderator analyses. Section 5 concludes.

2 Theoretical framework and hypotheses

2.1 Value adding through operational value creation and governance

Operational value creation in the portfolio company lies at the core of PE return generation and can be attained through operational improvements and/or strategic redirection (Castellaneta et al., 2019). The former is primarily achieved by increasing revenues or by improving the company's cost structure, increasing its margins and optimizing its assets (Gompers, Kaplan,

& Mukharlyamov, 2016; Puche, Braun, & Achleitner, 2015). Strategic redirection on the other hand can create value through corporate refocussing (Aslan & Kumar, 2011; Gadad & Thomas, 2004), introducing an entrepreneurial mindset which leads to corporate revitalization and organic growth (Ireland, Hitt, & Sirmon, 2003; Meuleman et al., 2009) and strategic innovation (Amess, Stiebale, & Wright, 2016) or implementing a buy and build strategy (Bansraj, Smit, & Volosovych, 2019; Hammer, Hinrichs, & Schweizer, 2016).

Most commonly applied, traditional agency theory suggests that the separation of ownership and control may create incentive misalignments between agents (i.e., the firm's managers) and principals (i.e., the firm's shareholders), which may induce the managers not to act in the best interest of the shareholders (Jensen & Meckling, 1976). PE investors often target poorly governed firms with high agency problems to enhance the corporate governance and thereby minimize agency costs and increase the firm's value (Acharya, Gottschalg, Hahn, & Kehoe, 2013; Wright, Amess, Weir, & Girma, 2009). They do so by debt bonding, requesting management to acquire equity ownership, active monitoring and reinforcing the board of directors. First, additional to levering up capital gains, the high levels of debt with which buyouts are usually financed urge management to create sufficient cash flow to meet debt obligations and thereby leave little room for personal consumption investments (Kaplan & Strömberg, 2009). Next, requesting management to acquire a stake in the company aligns their goals with those of the shareholders and incentivizes them to act in their interests (Acharya et al., 2013; Kaplan & Strömberg, 2009). Third, PE investors will also actively monitor management after investing to evaluate the management's effort and modify when necessary (Bloom, Sadun, & Van Reenen, 2015). Enhanced monitoring arguably not only arises from the PE investor but can also be inter-management as managers are also equity – and hence firm value – claimants and will monitor fellow managers (Meuleman et al., 2009). Lastly, PE investors may further enhance governance through designing powerful boards, which are

smaller, truly independent and as a result more efficient (Coles, Daniel, & Naveen, 2008; Hermalin & Weisbach, 1998).

Both operational value creation and governance enhancements take time to be implemented and their outcomes to be apparent. Resources stemming from access to the investor's expertise, management assistance and monitoring are accumulating during the buyout's lifetime, and hence increasingly and sustainably translate into operating performance gains – and especially growth – through competitive advantage (Castanias & Helfat, 2001; Ireland et al., 2003). This is furthermore consistent with PE investors indicating that they typically focus more on increasing their targets' growth and enhancing incentives and governance structures than on reducing costs (Gompers et al., 2016). They thus identify more with sustainably increasing the portfolio company's resource base than with appropriating quick and easy rents, which would be consistent with short-term performance gains, but might be detrimental to medium-to-long-term operating performance (Coff, 1999). Moreover, PE investors refocus corporate strategy and conduct growth-enhancing investments (Berg & Gottschalg, 2005; Schwetzler, 2007), all of which will not immediately result in value creation but rather take time to materialise. Taken together, we expect that the impact of PE on portfolio companies' operating performance will be more pronounced in the medium-to-long term. This leads to our first hypothesis:

Hypothesis 1a: *PE buyouts have a positive impact on portfolio companies' operating performance in the medium-to-long term.*

2.2 Value transferring from pre-investment stakeholders

A second PE performance enhancing mechanism is transferring wealth from pre-buyout stakeholders to the PE investor (Froud & Williams, 2007; Shleifer & Summers, 1988). While pre-LBO shareholders benefit significantly from positive abnormal returns in PTP buyouts (Bargeron, Schlingemann, Stulz, & Zutter, 2008; Renneboog, Simons, & Wright, 2007), neither bondholders (Baran & King, 2010; Billett, Jiang, & Lie, 2010) nor suppliers (Brown, Fee, &

Thomas, 2009) benefit from a leveraged buyout. Customers face marginal price increases but benefit from more new product introductions and product availability (Eaton, Howell, & Yannelis, 2020; Fracassi, Previtero, & Sheen, 2019). Portfolio company employees are the most heavily debated and researched stakeholder group and are frequently argued to suffer most following a PE buyout. Literature reviews acknowledge conflicting findings on PE's impact on employment and wages (Lutz & Achleitner, 2009; Tåg, 2012; Wright, Pruthi, Amess, & Alperovych, 2019), which, we argue, could be driven by amalgamating short-term and medium-term effects, which could be opposite. Short-term employment effects are expected to be negative as debt servicing, substantial ownership stakes and close monitoring, incentivizes and pressures management – almost instantly after investing – to engage in cost-reducing operations and strategic repositioning (Berg & Gottschalg, 2005; Schwetzler, 2007). This most likely results in the immediate divestment of unproductive workers and establishments (Bharath, Dittmar, & Sivadasan, 2014), thereby negatively affecting short-term employment levels. In the medium-to-long term, however, employment should be positively impacted as new recruitments will be needed following the initial cost reductions and layoffs to sustain the newly-created growth. PE investors who pursue such a growth-oriented strategy will invest in their portfolio company's employment base through increased employment security, wage growth and employee training (Bacon, Wright, Ball, & Meuleman, 2013). We therefore hypothesize:

Hypothesis 1b: *PE buyouts have a negative impact on portfolio companies' employment in the short term, but a positive impact in the medium-to-long term.*

2.3 Moderators

An important strength of a meta-analysis is its ability to uncover moderating effects (Borenstein et al., 2011). We argue that the pre-buyout ownership structure of the portfolio firm, the formal and the informal institutional context moderate the relationship between PE

and portfolio company real returns and are hence largely responsible for the conflicting results found in the empirical literature.

2.3.1 Pre-buyout ownership structure

A first moderator that we will consider is the pre-buyout ownership structure of the portfolio company, which is expected to impact value-adding opportunities, propensities and ensuing firm-level returns (Alperovych et al., 2013; Nikoskelainen & Wright, 2007). Because there is scarce evidence on the relationship between pre-buyout ownership structure and employment, we limit our analyses to the PE effect on operating performance, thereby differentiating between PTP buyouts and buyouts involving already private firms. In PTP buyouts, a public company or a division of a public company is acquired and delisted by a PE investor (Kaplan & Strömberg, 2009). High agency costs and limited monitoring resulting from the dispersed ownership structure of a publicly quoted company, weak managerial incentive mechanisms and an absence of entrepreneurial strategies create important value-adding opportunities and hence motivate PE investors to take these firms private (Kaplan & Strömberg, 2009; Renneboog & Vansteenkiste, 2017). In private-to-private deals on the other hand, a private company, rather than a public one, is bought by a PE investor. As traditional agency problems are less of an issue in private companies (Chung, 2011), investors are forced to focus on alternative value-adding strategies. Growth opportunities mainly consist of introducing an entrepreneurial mindset, relaxing financial constraints and improving the portfolio company's operations through newly presented management skills and/or experience (Cohn et al., 2020; Morris & Phalippou, 2020). On a general level, there are hence less value-adding opportunities compared to PTP buyouts.

Hypothesis 2: *Post-buyout operating performance gains are higher in public-to-private buyouts than in private-to-private buyouts.*

2.3.2 Institutional context

Our meta-analysis allows to explore how the institutional context in which a buyout takes place impacts the occurrence, properties and real outcomes of PE strategies (Capron & Guillén, 2009; Groh, Von Liechtenstein, & Lieser, 2010), by exploiting the different environments in which empirical studies took place. Even though most studies adopt a single country perspective, combining studies allows to exploit the heterogeneity in formal and informal institutional environments in which these studies took place.

First, we focus on formal institutions including the degree to which shareholders are protected and how labour is regulated, as both are central to PE value creation. The extent to which investors can legally protect themselves can be captured by the quality of contract and property rights enforcement and the effectiveness of a nation's courts (Kaufmann, Kraay, & Mastruzzi, 2009). As a result, stronger legal enforcement not only facilitates deals screening and origination (Cumming, Schmidt, & Walz, 2010), but also enhances the effectiveness of corporate governance (Aguilera & Jackson, 2003). For example, through their enhanced governance effectiveness, investor-friendly institutional frameworks mitigate agency costs (Cumming, Fleming, & Schwienbacher, 2006) and make it less complicated for external investors to lower a portfolio company's cost of capital and to increase its operating performance (Klapper & Love, 2004).

Hypothesis 3a: *Post-buyout operating performance gains are higher in countries with higher legal investor protection.*

Stringent labour regulations impede PE investors from quickly adjusting their portfolio companies' workforce or employee compensation downwards. Countries with less stringent labour regulations allow higher flexibility in restructuring portfolio company employment (Botero, Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2004). As early efficiency and productivity improvements could be easily made at the expense of employees (Amess, Girma, & Wright, 2008), profitability will be negatively affected in rigid labour regulatory frameworks

because layoffs are costlier (Bozkaya & Kerr, 2009). As a result, employment restructuring will be less prevalent in stringent labour regulated countries.

Hypothesis 3b: *Post-buyout employment is less negatively impacted in countries with more stringent labour regulations.*

Next to formal institutional frameworks, informal or cultural institutional dimensions matter in PE buyouts (Tian & Tran, 2019; Zhang, Zhan, Johan, & Cumming, 2019), as they help shape portfolio companies' organizational behaviours, decision-making and growth propensities (Boubakri & Saffar, 2016; Hofstede, 2011). Informal institutions are defined as "socially shared rules, usually unwritten, that are created, communicated, and enforced outside of officially sanctioned channels" (Helmke & Levitsky, 2004, p. 727). In individualistic societies, individuals are more to themselves, rather than being integrated in a close societal network in which members take care of each other in exchange for loyalty (Hofstede, Hofstede, & Minkov, 2010). Firms embedded in these frameworks have been associated with more organizational risk-taking as managers are more inclined to violate group norms to achieve higher investment returns (Li et al., 2013; Mihet, 2013). They also have higher innovation and creativity levels (Shao, Kwok, & Zhang, 2013; Taylor & Wilson, 2012), which leads to higher firm productivity (Lee & Peterson, 2000) and an entrepreneurial mentality (Pinillos & Reyes, 2011; Shane, 1993). While this would generate higher operating performance gains, employment could be negatively affected as individualistic firms are performance-oriented and are less concerned with societal norms but rather attribute great importance to the reward of their entrepreneurial success. Managers are therefore expected to be less hesitant to fire employees if this leads to greater performance gains.

Hypothesis 4a: *Post-buyout operating performance is higher in more individualistic countries.*

Hypothesis 4b: *Post-buyout employment is lower in more individualistic countries.*

3 Meta-analytical method of analysis

3.1 Sample selection

We conducted a systematic search procedure to identify empirical (published and unpublished) papers that studied the relationship between PE buyouts and their portfolio company's post-buyout operating performance and employment (Cooper, Hedges, & Valentine, 2019). In a first step, we searched Web of Science, SSRN and NBER using keyword searches including combinations of "private equity", LBO, MBO, MBI, buyout*, "operating performance", performance, efficiency, productivity, TFP, "total factor productivity", employment, "number of employees", HRM, employee*, wage* and "real effect*". Secondly, we manually searched 17 relevant journals in the field of entrepreneurship, business, management, strategy and finance (yielding a handful of additional studies). Thirdly, all reference sections of the retrieved papers were consulted to identify further studies and conversely, we looked up studies citing highly-cited retrieved papers. Fourthly, authors were contacted and asked for ongoing, unpublished research on the relationships of interest. Fifthly, we also searched the ProQuest Dissertations & Theses repository for doctoral dissertations using the aforementioned keyword searches. Because this search yielded too many results, we limited our search to the first 1,500 most relevant results. Lastly, we performed an additional search in Google Scholar where we reviewed the first 3,000 most relevant results. We finished our search for papers in July 2020.

The sample of retrieved studies was further refined to include only those papers that addressed our research question. Figure 1 gives an overview of this refinement process. The largest part of irrelevant papers was excluded based on a careful review of their title, keywords and abstract. Second, studies had to focus on PE buyouts, and hence not venture capital investments, non-PE buyouts or ownership changes in general. Third, the level of analysis had to be the portfolio company or establishment, and not the PE investor. Studies focusing on industry-level or employee-level data were also excluded from our meta-analysis. Fourth,

studies had to report statistics that could be converted into standardised mean differences (Cohen's d).[3] For those papers that met all previous criteria but did not report convertible statistics, the authors were contacted and asked to provide additional statistics. Lastly, we verified that none of the studies relied on the same samples, as this would lead to an overrepresentation of some samples and result in biased mean effect sizes. Following Wood (2008), studies with shared (co)authorship were checked to identify duplicate samples. In some papers, authors explicitly mentioned the overlap with a prior study. When there was an overlap in authorship but not in study or sample characteristics, the authors were contacted to confirm or disconfirm sample overlap.

The remaining studies were read, analysed and coded. All relevant study characteristics, sample specifications and effect size metrics were retrieved at the sample-level, allowing to code each individual sample. This is important since some studies report effect sizes on more than one sample, report on more than one outcome variable or report varying effect sizes over time. The number of samples is therefore larger than the number of studies in our meta-analysis. In a following step, we eliminated 7 samples that relied on survey data. Preliminary analyses suggest that they report significantly different effect sizes on both operating performance and employment, and therefore might not measure the same as archival data.

To ensure the robustness of our findings, we detected outliers in effect sizes by relying on a triangulation of methodologies: we looked at funnel plots (Higgins & Wells, 2011), the deviancy and sample-size adjusted deviancy from the average effect size (we marked studies with effect sizes more than three standard deviations from the average effect size) and normal quantile plots. If a sample is identified as an outlier by more than one method we marked the

[3] We do not consider regression coefficients, as this would require all regressions to include the exact same set of covariates (Hunter & Schmidt, 2004). Meta-analyses which included regression coefficients when bivariate statistics were missing have furthermore been shown to be associated with substantial biases (Roth, Le, Oh, Van Iddekinge, & Bobko, 2018).

sample as an outlier and excluded it from our analysis. Lastly, we excluded the study by Wright et al. (2007) because of its excessive effect sizes and the partial overlap with Amess and Wright (2007).

Figure 1 about here

3.2 Method of analysis

3.2.1 Overall analysis

We rely on a random effects (RE) meta-analysis, as it provides more accurate estimates than the fixed effect model when the true effect size is assumed to be different among samples (Borenstein et al., 2011). Consequently, observed variance in a RE meta-analysis consists of both between-sample variance (caused by moderators) and within-sample variance (caused by sampling error)(Thompson & Higgins, 2002). We accordingly apply a Hedges and Olkin (1985) methodology and weight effect sizes by the inverse of this observed variance. A meta-analysis can furthermore be based on various types of effect sizes. We rely on Hedges' g, a linear transformation of the Cohen's d statistic for point estimates of the overall effect sizes since nearly all studies reported dichotomous effect sizes (i.e., treatment versus control group statistics) and were easiest transformable to standardised mean differences (Cohen's d). Compared to Cohen's d, which tends to overestimate the absolute value of the true effect size, Hedges' g is an unbiased estimate (Hedges, 1981).

3.2.2 Moderator analyses

To analyse the effect of moderators, we run subgroup analyses and meta-regressions. In subgroup analyses, all samples are divided in separate subgroups based on moderating variables (Hunter & Schmidt, 2004). To ensure validity, we only consider interdependency-adjusted samples. Failing to do so would lead to seriously biased overall – and subgroup – effect sizes, since studies with more than one outcome (e.g., studies reporting effect sizes for T+1, T+2 and T+3) would have been attributed more weight (Cooper et al., 2019). To calculate such a study's

combined effect size, the underlying sample effect sizes (those for T+1, T+2 and T+3) are simply averaged and corrected for sample interdependency. To do so we apply a fixed effect meta-analysis at the study level for dependent samples. This results in a synthetic – weighted averaged – effect size for each independent study. For each subgroup a separate RE meta-analysis is run to calculate subgroup mean effect sizes, their confidence intervals and to establish further heterogeneity. Z-tests are performed to determine whether or not differences among subgroup effect sizes are statistically significant.

Secondly, we perform RE meta-regressions, which allow to include the full range of continuous moderator variables – thereby avoiding artificial dichotomization – and to test several moderators simultaneously (Gonzalez-Mulé & Aguinis, 2018). A meta-regression is a weighted least squares (WLS) regression with the respective samples' inverse variances as weights and regresses the effect sizes (Cohen's d) onto the included moderator and control variables. We use an iterative residual maximum likelihood (REML) estimator of residual heterogeneity τ^2 (Harville, 1977) and Knapp-Hartung modify standard errors to be superior in holding the nominal significance level (Knapp & Hartung, 2003). For each meta-regression we report the adjusted R^2 (the relative reduction in the between-study variance) the number of samples included (k), and the model's F-value.

In order to break down the heterogeneity found in the underlying samples, we include three moderators. A first moderating variable is the pre-buyout ownership structure where we differentiate between PTP and private-to-private deals. Unfortunately, studies that report separate effect sizes for each deal source are too limited to warrant reliable analyses, we therefore look at the relationship between the respective proportions of the ownership structures in the study's overall sample and the portfolio company's operating performance. While this methodology is common practice in meta-analysis (Cooper et al., 2019), it has implications for the interpretation of our results (as we will discuss below).

Our second moderating variable is the formal institutional context in which the PE buyout takes place. First, we separate common-law frameworks from civil-law frameworks. Common-law frameworks are more investor-friendly and should positively moderate the PE impact on operating performance (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998). Civil-law countries have more stringent labour regulations and should hence better protect portfolio company employees. Second, for the employment analyses we also measure a nation's formal institutional context with respect to labour regulation through the OECD's Strictness of Employment Protection (SEP) index , a longitudinal index which measures the extent to which employees are protected.

As we expect the cultural context to matter as well, we include individualism as a third moderator variable in our models (Hofstede et al., 2010).

3.2.3 Control variables

We further include several control variables that may account for variance irrelevant to our analysis. A first control variable is the study's publication status, which detects a potential publication bias which would occur when published studies report larger (more positive or more negative) and more significant effect sizes[4] than unpublished papers and are hence unrepresentative of the population of studies (Rothstein, Sutton, & Borenstein, 2005).

Second, we control for the PE activity during the underlying studies' sample periods. PE deals are procyclical and mostly driven by credit and equity market conditions (Robinson & Sensoy, 2016). Favourable lending standards and conditions, and increased liquidity lower the cost of capital (Axelson, Jenkinson, Strömberg, & Weisbach, 2013), thereby making more value-enhancing investments worthwhile and hence positively impacting operating performance gains. We use Thomson Reuters' Eikon database and measure the number of

[4] Although published papers may report relatively more significant effect sizes, this should not impair the validity of a meta-analysis since it aggregates all effect sizes, whether significant or not.

booms (i.e., peaks in PE activity based on the surrounding 7 years) occurring during the sample period and account for the fact that PE cycles differ geographically (Lerner, Sorensen, & Strömberg, 2009). This metric is consistent with other measures of PE activity found in the literature and in industry reports (e.g., Bain & Company, 2020; Kaplan & Strömberg, 2009; Renneboog & Vansteenkiste, 2017; Wilson, Wright, Siegel, & Scholes, 2012).

We furthermore control for the sample's time period by including a dummy taking on one if all deals in that sample occurred before the year 2000. There might be systematic differences between effect sizes from buyouts happening in the 1980's and 1990's compared to more recent ones, and in post-buyout effects between older papers and more recent ones due to, for instance, easier access to larger databases, higher quality data and enhanced statistical techniques.

Fourth, PE investors are very selective in order to generate the highest possible returns, hereby mainly targeting stable and profitable companies (Acharya, Hahn, & Kehoe, 2009), companies which are less financially distressed (Tykvová & Borell, 2012) and which are larger, more liquid and less leveraged (Bharath & Dittmar, 2010; Osborne, Katselas, & Chapple, 2012). This hence indicates a non-random target selection for firms with room for leveraging performance gains. As a result, studies that compare PE post-buyout effects to average peer companies without correcting for selection effects may report upward biased results (Acharya et al., 2009). We therefore compare the real effects in samples that did and did not control for selection issues and differentiate between four possible approaches to measure the PE effect. A first is by matching each PE-backed company with one or more non-PE-backed companies through propensity score matching or by selecting peer companies based on various pre-buyout company characteristics. This is expected to yield smaller effect sizes as this indirectly controls for a PE selection effect. A second approach is to compare PE-backed companies to a large set of non-backed companies (without any matching). A third approach is an event study where the

year before the buyout is compared with subsequent years after the buyout. A last way of measuring the PE effect is through a continuous independent variable (e.g., PE commitment).

Fifth, because operating and organizational performance are widely recognised as being multidimensional (Combs, Crook, & Shook, 2005), and following other meta-analyses on firm performance (e.g., Golicic & Smith, 2013; Rosenbusch et al., 2013; Stam et al., 2014), we combine samples reporting on different dimensions of operating performance and employment outcomes. As PE value creation is directed at growth or enhanced efficiency (Meuleman et al., 2009), we control for this and further differentiate between measures focussing on revenues (e.g., sales growth or sales/total assets), cashflow (e.g., EBITDA growth or EBIT/sales) profit (e.g., net income growth or ROA) or other (e.g., total factor productivity). The samples on employment include studies on the number of employees and employee wages.

4 Results

Our meta-analysis synthesizes 330 empirical samples from 60 independent studies covering 46 years. The aggregate sample size is 403,820 for the combined overall analyses and 226,588 for the (interdependency-adjusted) subgroup analyses. While these are admittedly not all distinct firms – since some studies report on both operating performance and employment or on multiple time frames – it provides a sense of magnitude. Effect sizes are based on the same reference year (one year prior to the buyout) in order to ensure comparability. Consistent with narrative literature reviews, we observe a lot of heterogeneity among samples, even among those measuring the same outcome variables. After eliminating outliers, operating performance effects vary from d = -0.63 to d = 0.82 and are for 55% of samples positive. Employment effects vary from d = -0.48 to d = 0.46 and are positive for 48% of samples.

4.1 Overall effects and tests of sample heterogeneity

Table 1 presents the results for the meta-analyses on post-buyout operating performance and employment. While we are not specifically interested in overall effect sizes, we do find a substantial amount of heterogeneity among effect sizes, corroborating earlier observations.

First, both analyses show statistically significant Cochran's Q statistics (the absolute amount of heterogeneity). Second, I^2 (the relative amount of heterogeneity) is 73% and 59% for the analyses on operating performance and employment, respectively. Third, we find non-zero estimates of between-study variation τ^2, suggesting that moderating effects are present. We are therefore confident that underlying moderators drive this heterogeneity, and hence that moderator analyses are warranted.

Table 1 about here

For our first hypotheses, we run RE meta-regressions and include the time effect as the independent variable. We differentiate between one, two, three and more than three years post-buyout, relative to the year preceding the buyout. Unfortunately, some studies do not explicitly mention this post-buyout time period or consider the entire PE ownership period. In those cases, and based on existing empirical evidence and own findings, we labelled those effects as being measured more than three years post-buyout.[5] Table 2 presents the average effect sizes for these four different post-buyout years, which are predictive margins of the time covariate at those respective values. As hypothesized (H1a), we find significantly positive effect sizes for operating performance in the medium (T+3) and long-term (T>3). It appears that PE investors' initial investments, strategic redirection and other value-adding activities indeed yield positive results, albeit not instantaneously. The short, medium and long-term impact of PE on employment is insignificantly negative. We therefore fail to find support for a short-term value-

[5] Most papers find an average private equity holding period of around five years (e.g., Degeorge, Martin, & Phalippou, 2016; Harris, Jenkinson, & Kaplan, 2014; Kaplan & Strömberg, 2009; Lopez-de-Silanes et al., 2011). However, others challenge this view and find short-term holding periods of around three years (e.g., Bonini, 2015; Caselli, Garcia-Appendini, & Ippolito, 2009; Tykvová, 2006; Valkama, Maula, Nikoskelainen, & Wright, 2013). We additionally analysed 15,300 private equity transactions ourselves and found a median holding period of 5.1 years. We therefore chose to consider effect sizes measuring the whole buyout period as measured more than three years post-transaction.

transferring effect, through which value would be transferred from portfolio company employees to the PE investor.

Table 2 about here

4.2 Moderator analyses

To analyse the importance of moderators, we perform subgroup analyses and meta-regressions. Results for the (unreported) subgroup analyses on post-buyout operating performance only show a significant moderating effect for the institutional context with more investor-friendly countries having significantly positive effect sizes which are also significantly greater than the effect sizes found by studies focussing on less investor-friendly countries. The subgroup analyses on post-buyout employment show no moderating effects. These overall insignificant results are potentially caused by the limited number of underlying samples (as subgroup analyses are based on interdependency-adjusted samples), not accounting for potentially important spurious factors, and the dichotomizing of independent variables. All of these factors are addressed in meta-regressions.

4.2.1 Pre-buyout ownership structure

The pre-buyout ownership structure of the portfolio company matters for subsequent operating performance gains. Interestingly, we do not find support for H2 as the coefficient for the proportion PTP buyouts is negative in table 3. Moreover, the proportion of private-to-private buyouts is significantly positively related to operating performance gains. This is furthermore economically significant as a 10% increase in the proportion of private-to-private buyouts in a

study's sample, increases its expected effect size with 0.014, which is more than a 70% increase from the overall mean effect size on operating performance (see table 1).[6]

Table 3 about here

4.2.2 Institutional context

Table 3 further shows the results for the moderating role of the formal and informal institutional context on the relationship between PE and post-buyout operating performance. Consistent with earlier findings from subgroup analyses, investor-friendly frameworks positively moderate this relationship. Samples reporting on common-law frameworks document on average a 0.133 higher effect size than samples reporting on civil-law frameworks. This supports the view that frameworks with higher investors protection provide enhanced governance effectiveness and foster and reward risk-taking (H3a). Our findings do not substantially change when we include an Anglo-Saxon dummy, the most investor-friendly countries in our sample (Groh et al., 2010; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000). The legality index (Berkowitz, Pistor, & Richard, 2003; Cumming et al., 2010) – although not measuring investor-friendliness per se – and minority investor protection (Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2008) – although PE investors are mostly majority investors – also point in the same direction (but are insignificant).

Next to the formal institutional context, portfolio companies' cultural context also moderates the relationship at study. More individualistic countries show higher post-buyout operating performance gains, consistent with the notion that these cultures are associated with more risk-taking and are more inclined to violate group norms to achieve higher performance (H4a). This

[6] The divergent significance levels between the proportion PTP and private-to-private buyouts are potentially caused by the fact that not all studies report equally detailed on the ownership situation pre-buyout. For instance, studies often report on divisional buyouts as well, but it is not always clear how many of those originate from public or private parent companies. We only included those samples with unambiguous transaction classifications.

result remains (but tuns insignificant) when we include the minus of the Global Leadership and Organizational Behaviour Effectiveness (GLOBE) in-group collectivism indicator instead of individualism (House, Hanges, Javidan, Dorfman, & Gupta, 2004).

The results on the moderating impact of the institutional context on the PE–post-buyout employment relationship are presented in table 4. Less socially-oriented – and hence less employment-friendly – frameworks (i.e., common-law countries) show on average more negative effect sizes, supporting the view that these frameworks offer more flexibility to PE investors to restructure their portfolio companies' employment base (H3b). This is further corroborated by the positive and highly significant SEP coefficient, implying that employment protection laws benefit portfolio companies' employees. These results are robust when considering Botero's et al. (2004) Employment Laws Index or an Anglo-Saxon dummy.

Individualistic frameworks negatively moderate the relationship between PE and their portfolio companies' employment, supporting hypothesis 4b. The risk-taking mentality embedded in individualistic cultures may be beneficial to operating performance, it is however detrimental to portfolio companies' employment. Social norms are easily put aside, and as performance and success are attributed great value, employees might be negatively affected. Our results hold when considering the minus of the GLOBE's in-group collectivism indicator instead of individualism.

Interestingly however, when considering formal and informal institutions simultaneously, the analyses on operating performance (column 5, table 3) show the persisting role of the formal institutional context, while analyses on employment (column 4, table 4) show the persisting role of the informal institutional context.

Table 4 about here

4.2.3 Methodological factors

Although not the focus of this study, we find that methodological factors also contribute to variability in effect sizes. More specifically, studies on operating performance comparing PE-backed firms to a random set of non-PE-backed firms without matching (d = 0.16) yield on average significantly greater effect sizes than studies applying event study or matching (albeit insignificantly) methodologies. The average effect size on post-buyout employment is in general even significantly negative for studies applying matching methodologies (d = -0.09). These findings corroborate a potential selection effect, as not taking this into account (by for instance comparing PE-backed to random non-PE-backed companies) clearly overstates the real effect of PE.

Post-hoc analyses further reveal differences in the measures of operating performance. PE investors clearly focus on growing portfolio companies, rather than on enhancing efficiency, as we find that overall operating performance gains are driven by growth related measures. Post-buyout employment effects do not differ between wages or employee numbers.

4.3 Publication bias analyses and robustness checks

Publication bias occurs when "the research that appears in the published literature is systematically unrepresentative of the population of completed studies" (Rothstein et al., 2005, p. 1) which is a result of the suppression of significant or small effect sizes. Additional to meticulously searching and including unpublished papers, we tackle this bias in four ways. We first control for the publication status of the underlying samples in all meta-regressions (Geyer-Klingeberg, Hang, & Rathgeber, 2020). This coefficient is insignificant in all regressions. Second, we re-ran all regressions thereby including only the published studies and did not find different results. Third, while the funnel plot showed minor asymmetry, trim and fill analyses suggested that this asymmetry was purely caused by heterogeneity rather than publication bias (Duval & Tweedie, 2000). Fourth, we ran cumulative meta-analyses and did not find any substantial drifts, which would have suggested publication bias (Borenstein et al., 2011).

We furthermore reran all analyses with the inclusion of outliers and survey samples – but controlled for the latter in meta-regressions – and also did not find different results.

In previous analyses we classified the time effect as being long-term (i.e., T > 3) if (i) the underlying study did not specifically report the post-buyout year in which the PE effect was measured, or (ii) if the study specifically considered the whole PE ownership period. Our results remain if we classify the time measure for these samples as being the medium-term (i.e., T+3).

Lastly, although we control in our meta-regressions for interdependency at the sample level by including time, measurement and methodological controls, error terms might still be correlated since we have multiple observations per study. To fully account for this we ran weighted least squares regressions with clustered standard errors at the study level. The weights were determined by the inverse of the within-sample variance plus the estimate of the between-sample variance τ^2 from the respective meta-regressions (estimated via residual maximum likelihood). We again did not find substantially different results.

5 Discussion

5.1 Discussion and suggestions for further research

We find a positive medium-to-long term impact of PE on operating performance, but fail to identify a significant PE effect on employment. This last finding is not unimportant as we hence also fail to identify a significant value transferring role of PE, contradicting popular claims by PE opponents. The major contribution of the present analysis is to provide insights into what factors drive the real impact of PE, and hence should be controlled for in future work.

First, our findings show that short-term and medium-to-long-term effects on operating performance are fundamentally different. Empirical studies that rely on shorter post-buyout time frames might not find the positive effects on operating performance that are only revealed in the medium-to-long term, explaining in some parts the conflicting results found in the literature. These findings suggest that PE value creation, stemming from value-enhancing investments, strategic repositioning, introducing corporate entrepreneurship, management

assistance and monitoring, does not happen by chance but rather takes time to evolve. Our analyses furthermore show that PE investors indeed focus on growing their portfolio companies, rather than on reducing costs and consequently enhancing efficiency, consistent with self-reported survey evidence from Gompers et al. (2016). The number of employees and wages, on the other hand, are not differently impacted over time, nor among measurements. Our results hence suggest that the PE model is targeted at increasing operating performance through growth, rather than extracting rents in the form of layoffs or lower compensation. While coefficients in the overall analyses on employment remain insignificant, we admittedly also found substantially fewer papers covering post-buyout employment compared to papers covering operating performance. We therefore encourage scholars to include sufficient longitudinal data in their analyses on the real effects of PE, and particularly focus on lesser studied real effects (such as wages), but also on those real effects which we could not include due to a lack of empirical studies (e.g., innovation and internationalization). It would also be interesting to see more studies focussing on the long-term PE impact on portfolio companies. More specifically, we lack knowledge on how these longer term effects are obtained. Are they the result of specific (long-term oriented) investments? Could they also have been obtained without PE investments? Do they persist after the PE has exited (does the 'PE mentality' hence persists)? Is long-term operating performance achieved at the expense of short-term performance? Are successful buyouts the results of a good fit between PE investors and portfolio companies based on their respective propensities and capabilities to achieve long-term performance (and does this hence explain why other PE buyouts are capable of achieving short-term performance gains)?

Second, while traditional agency cost reductions are commonly associated with PTP performance gains, our analysis shows that operating performance gains in PTPs are lower than those found in private-to-private buyouts. This raises the question through which processes

these performance gains are obtained, as they clearly are not a sole result of reductions in traditional agency costs. Post-hoc analyses show that portfolio company age or size are not driving our results, suggesting that a potential lack of professionalism pre-buyout is not causing outperformance in private-to-private buyouts. Cohn et al. (2020) provide valuable insights based on U.S. data and show that target selection might be an important driver as private-to-private buyouts are disproportionality focused on poorly performing firms or on firms with substantial growth potential. Further evidence of value drivers in private-to-private buyouts in different settings is warranted. For instance, despite suffering less from traditional agency costs due to the combination of ownership and management, agency costs of self-control are particularly present in private firms and occur when owner-managers take actions that negatively impact the firm and its owners (Schulze, Lubatkin, Dino, & Buchholtz, 2001). The PE governance model, by imposing specific control mechanisms, hence seems to be helpful in mitigating the agency costs of self-control found in private targets (Schulze & Zellweger, 2020). Research on privately held family firms – a considerable proportion of private-to-private buyouts – might additionally provide critical insights as the preservation of socioemotional wealth incentivizes the management to keep the company afloat, but agency costs might be particularly high due to conflicts in culture between the family and PE investors (Carney, Van Essen, Gedajlovic, & Heugens, 2015; Croce & Martí, 2016).

Third, formal and informal institutional factors alter the magnitude of the PE real effect in portfolio companies. Formal institutions have been studied with respect to PE activity (Bozkaya & Kerr, 2009; Cumming & Johan, 2007; Groh et al., 2010), PE contracting (Lerner & Schoar, 2005), investment returns (Lerner et al., 2009) and investment exits (Johan & Zhang, 2016). Our findings suggest that also portfolio company outcomes are affected by national institutions. More specifically, enhanced investor protection and governance effectiveness are likely to be crucial in increasing value-adding capabilities and by consequence, operating performance

(Groh et al., 2010). Although not frequently applied in PE literature, cultural institutions also matter. For example relying on the GLOBE framework, Hammer, Hinrichs, and Schwetzler (2018) found that performance-orientation in portfolio company countries is negatively related to post-buyout operating performance gains. While our analysis – seemingly contradictory – indicates that individualism is positively related to operating performance, subtle differences in both metrics and the negative correlation between both might cause these divergent results (Hofstede, 2006; Smith, 2006). The positive effects we find for individualistic countries are most likely the result of their increased organizational risk-taking and pertinent focus on investment returns. Although we cannot decisively link the two, the decrease in employment in these cultures might suggest a value-transfer mechanism leading to performance gains. Although the aggregation of studies from various institutional frameworks is an important strength of our analysis, our sample is highly skewed as most studies rely on U.S. or U.K. data. To further increase our understanding of institutional factors moderating PE real effects, we need more evidence on the effects of PE in other countries and other institutional contexts. Furthermore, and most imperatively, multi-country studies are warranted as meta-analytical results are only indicative and do not provide causal or direct evidence. This would also allow to study differences in formal and cultural institutions between PE investors and portfolio companies and how these differences impact investment outcomes. Although Hammer et al. (2018) provide an excellent first step in this direction, other cultural dimensions should also receive attention. Specifically interesting are the mediating factors driving these results. For instance what specific set of cultural characteristics is most favourable for value-adding capabilities? Furthermore, do buyouts of large, international companies, which are subject to various cultural influences also exhibit these effects?

Methodologically, selection effects might distort empirical findings on PE real effects. PE investors apply a non-random target selection when investing, raising the question to what

extent post-buyout performance gains originate from PE value-adding rather than from mere target selection. Indeed, our results indicate that studies that apply event study methodologies report smaller effect sizes than studies comparing PE-backed firms to random non-PE-backed firms, and hence do not control for a potential selection effect. An increasing number of studies addresses selection effects by applying more rigorous research methodologies to disentangle selection from treatment effects. We encourage other researchers to follow their lead and include comprehensive matching methodologies such as propensity score matching as this decreases potential endogeneity concerns and additionally controls for an observable selection effect. Sufficiently long longitudinal data further allow to control for unobservable industry-, firm- and geography-based selection effects.

5.2 Limitations

Our analysis suffers from a number of limitations. First, findings from meta-analyses are only capable of providing causal evidence when the underlying studies also have done so. As this is not the case for this study, our findings should be interpreted accordingly. Furthermore, while our analyses indicate the general direction of PE real effects on their portfolio companies, it does not show how these real returns are obtained. For example, we find positive operating performance effects in the medium and long term, but cannot link this to employment effects. Our analyses furthermore show significantly positive effect sizes for growth related measures, but do not provide evidence on the underlying mechanisms at play. Bircan, Biesinger, and Ljungqvist (2020), however, provide an excellent and timely analysis on this topic.

Second, we could only capture effect sizes from studies that reported detailed and useful univariate statistics. While we contacted authors for which this was not the case, there might be a potential reporting bias if effect sizes differ systematically between studies that report useful statistics versus studies that do not. We are however not aware of any method to detect or control for this bias.

Third, while we control for various variables which potentially impact post-buyout operating performance or employment, we are nevertheless limited to those reported in the underlying studies. Many other spurious factors, for which we have no information, have been shown to influence the relationships at study. Examples include PE experience (Alperovych et al., 2013), syndication (Huyghebaert & Priem, 2016), specialization (Le Nadant, Perdreau, & Bruining, 2018) and institutional affiliation (Fang, Ivashina, & Lerner, 2013). We also lack more detailed information on the portfolio companies and their control groups (non-PE or pre-PE in the case of event studies). Important control variables could for instance include past operating performance and employment, growth thereof, industry characteristics, and family ownership.

Finally, we measured the effect of the pre-buyout ownership structure via the proportion of each ownership structure in the underlying samples. This measure, although commonly used in meta-analysis, is not perfect. We would rather have separate effect sizes for each subsample of PTP and private-to-private buyouts as this would provide us with a much cleaner measure and would concretise the interpretation of the moderating effects.

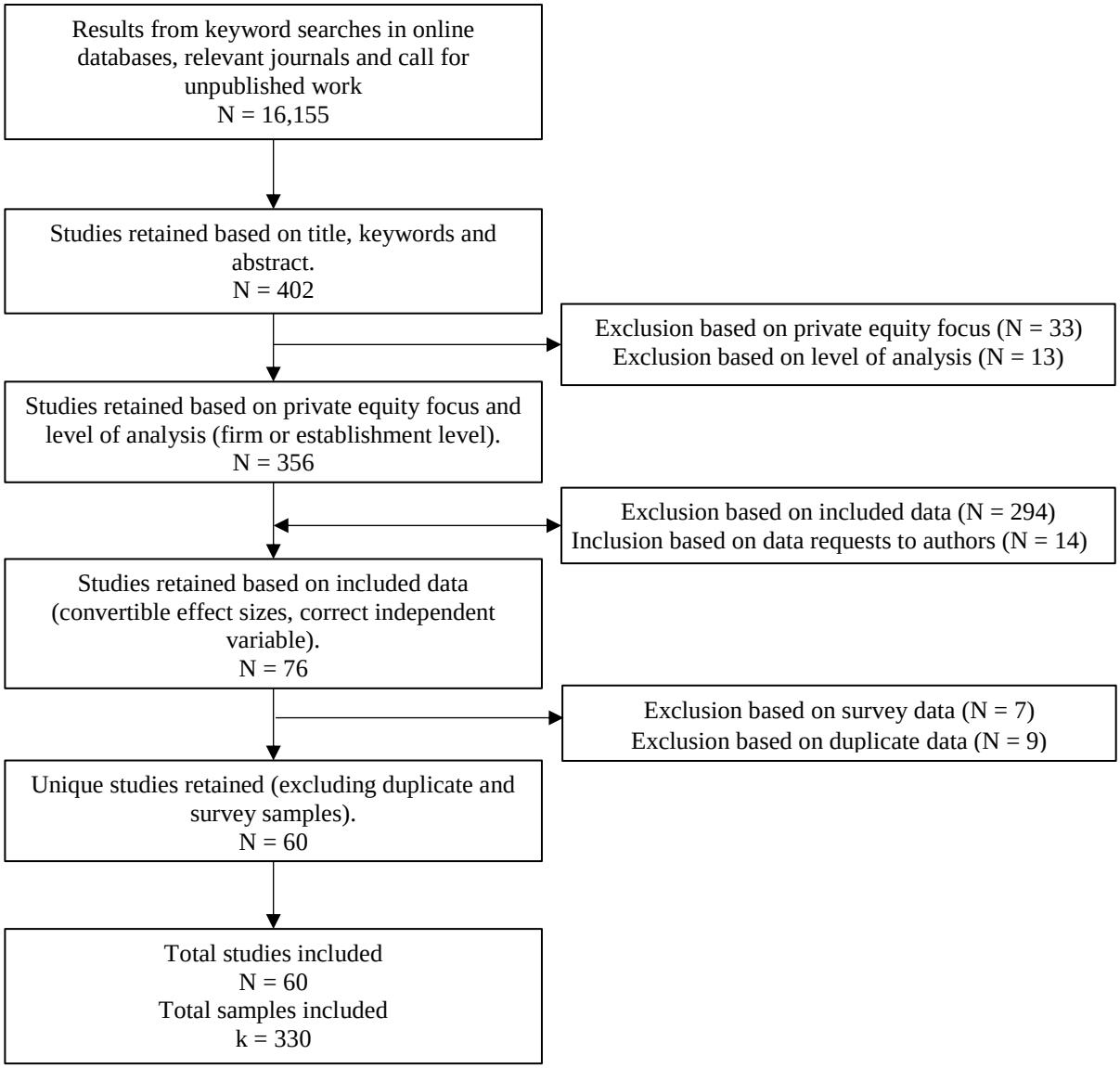
5.3 Conclusion

Driven by disparate evidence in the literature on post-buyout performance, the goal of this study was to understand whether, first, PE creates value in buyouts on average, and second, which mechanisms more strongly contribute to value creation. We quantitatively reviewed the empirical literature on the relationships between PE and post-buyout operating performance and employment by synthesising 330 samples from 60 independent studies with an aggregated sample size of 403,820 firms. Overall, we find a positive medium-to-long-term PE effect on operating performance, but fail to find significant average effect sizes for employment. It hence appears that PE investors focus on growing companies rather than on extracting rents from employees. The significant heterogeneity in effect signs and sizes reported in extant studies further points to the existence of meaningful moderators. Interestingly, in contrast with predictions of agency theory, PE has a more positive effect on operating performance in private-

to-private buyouts than in PTP buyouts, both in the short and medium term. Formal institutions also matter: PE investors investing in more investor-friendly countries have a stronger positive impact on operating performance, whereas buyouts in countries with better employment protection show smaller decreases in employment. Finally, PE investors operating in more individualistic cultures realise significantly larger operating performance gains at the expense of employment levels, which are negatively impacted.

6 Figures

Figure 1: Graphical representation of the search and elimination strategy



7 Tables

Table 1: Mean effect sizes and heterogeneity statistics

	g	CI95%	k	N	Q	I^2	T^2
Operating performance	0.020	[-0.016; 0.057]	68	159,472	247.32***	72.91%	0.018
Employment	0.000	[-0.029; 0.029]	36	67,116	84.71***	58.68%	0.004

Notes: This table presents random effects meta-analyses corrected for within-study sample interdependency. g denotes Hedges' g, CI95% presents the 95% confidence intervals, k is the number of study samples, N is the aggregate number of firms. Heterogeneity statistics include Cochrane's Q, the percentage variation due to heterogeneity (I^2) and the between-study variance (T^2). ***:p < 0.001

Table 2: Average effect sizes for subsequent post-buyout years

	Operating Performance	Employment
@ T+1	0.037	0.009
	(0.036)	(0.047)
@ T+2	0.042	-0.010
	(0.022)	(0.030)
@ T+3	0.048**	-0.028
	(0.017)	(0.021)
> T+3	0.054*	-0.046
	(0.025)	(0.030)
Number of samples	223	72

Notes: This table presents predictive margins for the effect sizes (Cohen's d) based on meta-regressions controlling for publication status, PE activity, sample time period, how the PE effect was measured and the counterfactual methodology. The underlying regressions are available upon request. Standard errors in parentheses; **: p < 0.01, *: p < 0.05

Table 3: Moderating effects on the relationship between PE and portfolio company post-buyout operating performance

	DV= Cohen's d				
	(1)	(2)	(3)	(4)	(5)
Published	-0.084	-0.033	-0.097	-0.054	-0.090
	(0.057)	(0.060)	(0.052)	(0.051)	(0.066)
Boom cycles	0.038	0.037	-0.027	-0.010	-0.041
	(0.041)	(0.040)	(0.039)	(0.037)	(0.045)
Sample < 2000	0.248***	0.265***	0.078	0.072	0.148*
	(0.062)	(0.060)	(0.057)	(0.058)	(0.068)
% PTP	-0.015				
	(0.054)				
% Private-to-private		0.143*			0.146*
		(0.069)			(0.067)
Common-Law			0.133**		0.216*
			(0.045)		(0.099)
Individualism				0.002**	-0.001
				(0.001)	(0.002)
Measurement controls	YES	YES	YES	YES	YES
Methodological controls	YES	YES	YES	YES	YES
Time effect controls	YES	YES	YES	YES	YES
Number of samples	182	182	231	231	182
Adjusted R^2	0.219	0.239	0.183	0.178	0.283
F	3.892***	4.240***	3.762***	3.681***	4.637***

Notes: This table presents the moderating effects of the portfolio company's pre-buyout ownership structure and the formal and informal institutional context on the relationship between PE and post-buyout operating performance. Full regression results are available upon request. Knapp-Hartung modified standard errors in parentheses; ***:$p < 0.001$, **: $p < 0.01$, *: $p < 0.05$

Table 4: Moderating effects on the relationship between PE and portfolio company post-buyout employment

	DV= Cohen's d			
	(1)	(2)	(3)	(4)
Published	0.099	0.015	0.039	0.028
	(0.060)	(0.064)	(0.058)	(0.058)
Boom cycles	0.117**	0.108*	0.079*	0.096*
	(0.040)	(0.042)	(0.037)	(0.039)
Sample < 2000	-0.029	0.015	-0.075	-0.023
	(0.085)	(0.098)	(0.081)	(0.090)
Common-Law	-0.204***			
	(0.043)			
Strictness of Employment		0.116***		0.043
Protection		(0.032)		(0.035)
Individualism			-0.006***	-0.005***
			(0.001)	(0.001)
Measurement controls	YES	YES	YES	YES
Methodological controls	YES	YES	YES	YES
Time effect controls	YES	YES	YES	YES
Number of samples	72	72	72	72
Adjusted R^2	0.351	0.262	0.386	0.390
F	4.053***	3.028**	4.506***	4.315***

Notes: This table presents the moderating effects of the formal and informal institutional context on the relationship between PE and post-buyout employment. Full regression results are available upon request. Knapp-Hartung modified standard errors in parentheses; ***:$p < 0.001$, **: $p < 0.01$, *: $p < 0.05$

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