

Employee ownership and firm performance: a meta-analysis

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Employee ownership has been an area of significant practitioner and academic interest for the past four decades. Yet, empirical results on the relationship between employee ownership and firm performance remain mixed. To aggregate findings and provide potential direction for future theoretical development, we conducted a meta-analysis of 102 samples representing 56,984 firms. Employee ownership has a small, but positive and statistically significant relation to firm performance ($\bar{r}=0.04$). The effect is generally positive for studies with different sampling designs (samples assessing change in performance pre-employee-post-employee ownership adoption or samples on firms with employee ownership), different performance operationalisation (efficiency or growth) and firm type (publicly held or privately held). Suggesting benefits of employee ownership in a variety of contexts, we found no differences in effects on performance in publicly held versus privately held firms, stock or stock option-based ownership plans or differences in effects across different firm sizes (i.e. number of employees). We do find that the effect of employee ownership on performance has increased in studies over time and that studies with samples from outside the USA report stronger effects than those within. We also find little to no evidence of publication bias.

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INTRODUCTION

Shared capitalism refers to a variety of employee ownership plans where a part of employee compensation and/or wealth is tied to workplace or firm performance (Freeman *et al.*, 2010). Practitioner interest in this phenomenon has increased over the past four decades, and according to the National Center for Employee Ownership, as of 2013, 28 million US employees were participating in 11,000 employee ownership plans. Through such plans, employees are now controlling about 8% of corporate equity in the USA (<http://www.nceo.org/>). In Europe, 85% of publicly traded firms have employee stock ownership plans, and in 2011, 10 million employees in Europe held some form of company stock. Employee ownership plans have also received broad academic interest in fields ranging from strategic management (Jochim, 1979) to organisational behaviour (Lawrence, 1987; Pierce *et al.*, 1991) and from labour economics and finance (Gordon and Pound, 1990) to public policy (Freeman and Reed, 1983).

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Despite the significant practitioner and academic attention directed to the relationship between employee ownership and firm performance, empirical findings remain mixed. In his meta-analysis of 43 studies, Doucouliagos (1995: 58) found that 'correlations are stronger among labour-managed firms (firms owned and controlled by workers) than among participatory capitalist firms [firms adopting one or more participation schemes involving employees, such as ESOPs (Employee Stock Ownership Plans) or quality circles].' In another meta-analysis of 27 studies, Kruse and Blasi (1995: 26) concluded that studies on employee ownership and firm productivity or profitability frequently 'indicate better or unchanged performance.' Others have made more recent efforts to summarise the literature (e.g. Blasi *et al.*, 2003; Kaarsemaker, 2006), but it has been almost two decades since the last meta-analysis. And numerous empirical studies have been published since. Calling on the need for a meta-analysis, critics have questioned whether a small proportion of employee stock ownership is efficacious enough to increase firm performance, whereas others have highlighted the negative effects of employee ownership such as risk aversion and shirking (Freeman *et al.*, 2010). Clearly, theoretical development on employee ownership is limited and remains fragmented (Caramelli, 2011); indeed, a meta-analysis could guide future theoretical development. In reviewing the relationship between employee ownership and firm performance, Kaarsemaker and Poutsma (2006: 677) commented on the 'relative weakness of the results from empirical research,' which calls for a comprehensive meta-analysis of empirical studies in this rich, multidisciplinary literature. Thus, because of the mixed findings on the relationship between employee ownership and firm performance and to provide guidance for future theoretical development as Caramelli (2011) suggested, we conducted a comprehensive meta-analysis of all empirical studies on employee ownership published in the English language until 2013 in all disciplines. The identified empirical studies mostly examined stock ownership and stock option plans together, but some studies assessed the effects of these structures separately.

Scholars have studied employee ownership through the lenses of agency theory, human resource (HR) management, organisational behaviour and property rights, among others. Based on this diversity of disciplines, we are unable to draw on a core theoretical framework to build our hypotheses. Instead of hypotheses, therefore, we propose research questions. Based on the number of studies needed for statistical power in a meta-analysis, we tested several theoretically derived and methodological moderators for which sufficient numbers of correlations were available. This includes the effects of employee ownership on firm performance as follows: whether the relationship is stronger in publicly held (or publicly traded) firms than in privately held firms;¹ whether the effects of employee ownership are lower in samples including pre-employee or post-employee ownership adoption versus studies on employee ownership without the pre-post study design; whether employee ownership affects efficiency more than growth; whether the effect sizes in studies are stronger in firms with stock ownership versus those with stock option plans; whether effects are stronger in US firms versus non-US firms; and, finally, whether percentage ownership or number of employees strengthens the relationship between employee ownership and firm performance. Finally, we test for publication bias using Duval and Tweedie's (2000) trim and fill technique to test whether the journal impact factor moderates the ESOP-firm performance relation. This effort provides a clearer understanding of the relationship between employee ownership and firm performance. We begin by discussing the types of employee ownership plans and recent developments

in the literature, followed by our research questions and meta-analytic findings. We conclude by discussing the results and directions for future research.

THEORY DEVELOPMENT

The concept of shared capitalism encompasses a broad array of employee ownership practices. Beyond the traditional notion of employee stock ownership, shared capitalism includes a 'diverse set of compensation practices through which worker pay or wealth depends on the performance of the firm or work group' (Freeman *et al.*, 2010: 4). Employee ownership plans can be classified into six broad areas: (a) whether employees purchase company stock or they receive it as benefits; (b) if stock is purchased, do the employees receive it at a discount; (c) whether employees receive voting rights for owning firm stock; (d) differences in legal requirements related to the structure of the employee ownership plan; (e) whether employees are allowed to use pay from gainsharing plans to buy company stock;² and (f) whether employees voluntarily participate in the plan. Variations in firm motives, country and institutional differences result in a tapestry of 'distribution of claims and privileges' (Rousseau and Shperling, 2003: 553) among employees in firms and across countries. Given our brief overview and inability to review this rich and diverse body of work beyond this meta-analysis, we refer readers to comprehensive reviews in Carberry (2011), Kruse *et al.* (2010) and Kaarsemaker (2006).

Through employee stock ownership plans, employees can either purchase stock, receive it as a benefit or both. Under traditional retirement plans, employees can use their pre-tax income to purchase company stock, and often times, firms offer stock for purchase at a discount (Core and Guay, 2001). Stock options, as a mode of contingent ownership, give employees a right to buy a certain amount of stock at a fixed price over a period of time. Restricted stock gives employees the right to acquire stock through purchase (and may also be received as a benefit) but with certain restrictions (*e.g.* tenure or performance targets are met). Not all employee ownership plans entail transfer of ownership. Phantom stock and stock appreciation rights provide cash bonuses (or sometimes in equivalent of stock) equal to the value of a pre-defined number of shares. In worker cooperatives, worker-members buy membership interest or share at a fixed price. Overall, significant variations exist in the ways employees can use their own funds to acquire stock, especially with regard to national differences (Rosen, 2013). The ESOP World Forum (<http://www.esopworldforum.com/>) has reviewed variations in employee ownership plans worldwide.

Employee ownership plans also vary in the level of influence employees may exercise. At one end of the spectrum are worker cooperatives in which all employees vote and actively participate in management. At the other end of the spectrum are phantom stock or stock appreciation rights where participating in governance through ownership is restricted. In most developed countries, employee owners have the right to vote at annual meetings (Bruner, 1988; Rosen, 2013); however, the degree of influence varies depending on the percentage of stock the employees own, the firm's strategic priorities and country-specific variations. Although the legal requirements in some countries restrict the employee owners right to vote at annual meetings, in some countries, employees can participate and vote in board meetings directly.

In addition to modes of acquiring stock (through purchase or received as benefit) and differences in the level of participation (required by laws or facilitated by the strategic needs of the firm), employee ownership plans vary in their breadth. Generally, to qualify for tax benefits from broad-based stock ownership, firms must allocate shares broadly

and cannot discriminate among full-time employees, and allocations are based on an employee's relative compensation and tenure or a combination of the two. Although the law often requires participation criteria for stock ownership, in some cases, no legal requirements exist, and participation is decided through personnel policies. A detailed discussion of differences in laws for employers and employees related to employee ownership plans can be found in Rosen (2013) and Doyle *et al.* (2008). Next, we propose research questions for the meta-analysis.

Employee ownership and firm performance

There are competing frameworks for why employee ownership should improve performance. Studies over the years have relied on agency theory (Krueger, 1991), property rights (Rooney, 1988), incentive contracts (Flanagan, 1984) and broader frameworks in management. Agency theory predicts that ownership and control are separated and that employee stock ownership should provide necessary incentives to align the owners' and employees' goals. Property rights theory proposes that residual rights to profits through ownership provide necessary incentives, whereas the incentive contract framework draws on contract theory to design employee incentives based on the firm's objectives and its industry's competitive context (Bolton and Dewatripont, 2005). The broader management literature has focused on motivations and behaviours mediating the effect of employee stock ownership on performance (*e.g.* Gerhart *et al.*, 1995; Rosen *et al.*, 1990; Yanadori and Marler, 2006). We first review the aforementioned four perspectives and discuss the benefits and costs of employee ownership on firm performance.

Agency theory Organisations face agency costs because of the separation of ownership and control (Fama and Jensen, 1983). When goals between principals and agents are misaligned, agency problems may exist at the employee level, where monitoring costs and moral hazard could be higher. With flattening organisational structures and increased supervisory responsibilities, monitoring employee behaviour is increasingly difficult; therefore, employee ownership provides the necessary incentives to improve the firm's financial performance and reduce agency costs. Employee payoffs tied to firm performance create an ecology of incentive contracts throughout the organisation and align employees' and owners' interests. Although research has questioned whether small amounts of ownership under shared capitalism provide necessary incentives, agency theory predicts that employee ownership provides the necessary incentives to improve corporate performance (Igalens and Roussel, 1999; Oyer, 2004).

Property rights Employees are reluctant to invest in firm-specific human capital unless they have residual rights to profits (Hart and Moore, 1990; Wang *et al.*, 2009). Property rights refer to allocating residual rights to assets (Pierce *et al.*, 1991). Employee ownership provides rights to profits from and control over underlying firm assets. Higher residual rights provide a greater incentive to increase performance. As 'legitimate authority rests with property rights' (Blasi, 1988: 217), the property rights framework is increasingly important in explaining employee ownership dynamics in privatised firms in Eastern Europe (Bogetic, 1993) and China (Dong *et al.*, 2002). By providing residual rights, employee ownership encourages investments in firm-specific human capital (Hashimoto, 1981; Jovanovic, 1979) and elicits additional effort from employees. Firm-specific human capital further complements an organisation's resource bundles.

Incentive contracts theory Related to incentive contracts theory (Harris and Raviv, 1979; Kőszegi, 2014), because increasing firm performance is tied to increasing variable pay, employee ownership provides necessary incentives across the firm to increase firm performance. As employee compensation varies with the stock price, improvement in firm

performance increases the stock price that in turn increases variable compensation, in form of increase in the value of employee stock endowment. Incentive contracts, in the form employee ownership, are designed to influence effort toward job tasks, cooperation with stakeholders within and outside the firm and commitment toward the firm.

Broader management framework To encompass a series of studies in the management literature on employee ownership, we label it as 'broader management framework.' Extending Gerhart (2007), employee ownership may increase both vertical fit (or alignment with firm strategy) and horizontal fit (or, alignment with structures, technology, resources and employee practices). Rosen *et al.* (2005) suggested that an employee ownership culture indirectly supports the benefits of vertical and horizontal fit in improving involvement, information sharing and training. Expecting greater residual rights, employees increase investments in firm-specific human capital, a resource necessary to combine employee human capital with an idiosyncratic bundle of firm resources (Barney, 1990). In the strategy literature, employee ownership at the firm level is linked to implementing an innovation strategy successfully (Yanadori and Marler, 2006) and improving the performance of leveraged buyouts (Wright *et al.*, 1994). Put differently, employee ownership is believed to be a glue that helps increase the efficacy of overlapping and complementary organisational resources and practices. Active monitoring, participating in decision-making and greater commitment allow for integrating structures, technology and resources more effectively. Furthermore, information flow improves potential mismatches in internal fit, which are resolved through increased cooperation and coordination to improve horizontal fit (Cooke, 1994).

Employee ownership may also indirectly increase employees' level of involvement in their respective units. In an extensive study of 41,206 employees from 323 worksites of 14 firms, Freeman *et al.* (2010) found that employee ownership was directly linked to greater participation in decision-making and monitoring fellow employees. Although organisations are not required to create special participation conduits and practices under employee ownership plans nor are employees required to change their behaviours, complementary HR practices or organisational culture can still serve as channels to facilitate such participation.

Based on the previous discussion, employee ownership is clearly tied to firm performance. As such, employees have an incentive to align their behaviour, motives and actions to meet the organisation's strategic goals. Continuing from property rights behaviour, employee ownership allows firms to ensure that employees have skin in the game as they also have residual rights. Ledford (2014) stated that firms have adopted employee ownership to increase employee rewards and to shift the focus toward performance-based pay and improve strategic responses. Employee ownership allows for greater differentiation as employees improve horizontal fit by increasing responsiveness, enhancing the scope and scale of unit-level human capital and eliciting necessary cooperation from other unit-level employees.

Negative effects of employee ownership Despite the expected positive relationship between employee ownership and firm performance, others have proposed a negative relationship. Employees with different abilities or human capital do not receive their fair share of profits, and employees with lower abilities or human capital would gain disproportionately under employee ownership. While economic theory highlights the potential of free riding, recent work by Freeman *et al.* (2010) does not find support for free riding. Although employee ownership varies from a select few participating to a fully employee-owned organisation, varying perceptions of inputs and abilities among a heterogeneous set of employees may increase conflicts (Hansmann, 1996). Hansmann (1996) posits that employee ownership is more efficacious among homogeneous employees such as law partners.

Furthermore, employee ownership could also increase risk aversion among employees. Increasing levels of employee ownership could increase preference for firm stability if employees have significant endowments in the firm, but the resulting loss aversion may also reduce risk-taking (*cf.*, Sanders, 2001). Others have found that employee ownership increases entrenchment and exacerbates agency costs (Park and Song, 1995). Supporting the possibility of entrenchment, when firms adopt an employee ownership plan, stock markets tend to react positively if outside blockholders are present (Park and Song, 1995) or when activist blockholders are involved (Bethel *et al.*, 1998). Thus, improved governance from blockholders is necessary to attenuate expected agency costs of employee ownership. Yet, others have questioned whether small amounts of ownership are sufficient enough to motivate employees to elicit espoused behaviour (Blasi *et al.*, 1996).

Because of the mixed theoretical predictions and empirical findings on the effects of employee ownership on performance, we do not make a directional hypothesis, and instead, we pose the following research question:

Research Question 1. What is the relationship between employee ownership and firm performance?

Efficacy of employee ownership: privately held versus publicly held firms

Privately held firms are not publicly traded and are typically not subject to the same oversight and disclosures to which publicly held firms are subject. Publicly held firms traded on the stock market are generally larger in size; therefore, the motives and outcomes of employee stock ownership could be distinct from those for privately held firms. Private firms have concentrated ownership, in which a family or a small group of owners controls a majority stake in the organisation. Publicly held firms typically have diffuse ownership, are larger in size and employ more people (Berle and Means, 1932; Carberry, 2011), which represent a different governance structure from publicly and privately held firms. In the 1980s, tax benefits were the primary reason to adopt employee ownership plans in public firms in the USA. A lower tax bill leads directly to higher performance, reduces indirectly the cost of capital and increases cash flow from higher profits, allowing public firms to make more investments.³ For public firms, employee ownership may also reduce the threat of acquisition (Kaarsemaker, 2006).

Differences between publicly and privately held firms may influence the employee ownership–firm performance relationship. Concentrated ownership in private firms could lead to realising lower gains from employee ownership compared with gains in public firms. This occurs because of the lower liquidity of stock, where employees may have limited ability to ascertain a fair price for their stock. Private firms, in general, are smaller than public firms and are relatively less competitive; therefore, employees in private firms have limited strategic avenues to leverage their human capital compared with public firms, which can recombine their human capital with a broader set of resources to realise higher performance. Because public firms are subject to oversight from the government and from institutional investors, employees in such firms are less subject to moral hazard (*e.g.* tunnelling), are unable to benefit from external oversight and are more exposed to opportunistic behaviours. It is worth noting, however, that some studies have found that employee ownership leads to higher shareholder returns in public firms (Jones and Kato, 1995).

Even though share-repurchase programmes provide liquidity in private firms and a trust that oversees the employee ownership programme, private firms have a poorer quality of

financial reporting (Ball and Shivakumar, 2005; Hope *et al.*, 2013). Furthermore, concentrated ownership has been known to engage in policies that benefit owners the most (Durand and Vargas, 2003; Uhlener *et al.*, 2007). Although trusts could oversee the private owners, lower transparency in financial reporting (Bianco *et al.*, 2013; Michaely and Roberts, 2012) and lack of benchmarks for fair valuations such as a stock market may leave private firm employees at a disadvantage for ownership. It is well documented that private firms are opaque and their concentrated ownership leads to moral hazard and entrenchment (Morck *et al.*, 2004). Employees in private firms may thus face more hold-up problems that arise when alternate uses of human capital developed for the firm are limited. Public firm employees can be somewhat compensated for hold-up through stock price appreciation, but because private firms lack a stock market to decide the fair market value of the stock, employees may realise lower gains from ownership.

Larger and established public firms leverage HR practices more effectively than private firms (*cf.* Way, 2002); thus, it could be expected that employee ownership could improve performance in a public firm more so than in a private firm. Because public-firm employees tend to overweigh company stock in their retirement portfolios (Blasi *et al.*, 2010), they are more likely to increase effort in order to increase the overall value of their retirement portfolio.

Finally, owning stock in a privately held firm limits governance participation and enforcement. Concentrated ownership in the hands of a select few limits employee oversight and prevents employees from actively engaging in firm management. Relative to employees in private firms, the voting rights for public-firm employee stock owners give employees more influence on firm management. Although private firms may allow employees to participate in governance, concentrated ownership may overshadow employee oversight. With limited perception to influence the firm, performance gains could be lower in private firms.

In the previous discussion, our arguments are based on intuition in financial economics. This said, we do not aim to portray that employee ownership in private firms is inherently ineffective or that public firms are ideal for employee ownership. In fact, recent works by Kruse (2002) and Kaarsemaker (2006) have shown that employee ownership in worker cooperatives and privately held firms have a positive impact on firm performance. Privately held firms with shorter lines of sight and cohesive cultures are more conducive for employee ownership (Rosen *et al.*, 2005); therefore, it should not be construed that employee ownership is inherently poor for private firms.⁴

Against this background of systematic differences in adopting and leveraging employee ownership plans in private and public firms, we pose the following research question:

Research Question 2. Is the relationship between employee ownership and performance different in publicly held firms that in privately held firms?

Employee ownership and performance outcomes

Here, we focus on two types of performance outcomes: growth and efficiency. We acknowledge that employee owners may not directly influence strategic decisions in the upper echelons; however, they can be directly involved in implementing and executing firm strategy. Using growth as an outcome, the evidence on whether employee ownership increases preference to implement and execute innovation and risk-taking strategies is mixed (Harden *et al.*, 2010). Scholars in social psychology have construed employee ownership as an extrinsic

reward that is less likely to improve creative performance. For example, Harden *et al.* (2010: 228) concluded that ‘Taken together, past theory and empirical work on creativity and rewards has failed to provide an understanding of how best, if at all, to reward employees to achieve creative behaviour’. Furthermore, from their study of 25,014 respondents from a single company, they inferred that ‘shared capitalism and high performance work policies affect innovation outcomes through direct effects, interactions and indirect effects’ (Harden *et al.*, 2010: 248).

Although designed to improve strategic response and adaptation, employee ownership may not lead to pursuing growth; instead, preserving their endowment and firm-specific human capital employees would support strategies that increase risk-taking. Meade (1972: 426) proposed that ‘while property owners can spread their risks by putting small bits of their property into a large number of concerns, a worker cannot put small bits of effort into a large number of different jobs.’ Employees that are therefore risk-averse, due to the inability to diversify their human capital, lead to preferring efficiency over growth.

Related to efficiency as an outcome, firm-specific human capital represents a sunk cost. Employees would be reluctant, therefore, to support and execute risky strategies and prefer to maintain the status quo (Cannella, 1995). Employees would evaluate the ‘gamble [of improving value or controlling further decline in endowment] described in terms of its “probability of winning” rather than in terms of its “probability of losing” ’ (Levin *et al.*, 1998: 159). Increasing employee ownership implies deep social bonds and norms, and employees are more likely to focus on maintaining the status quo to reduce employment risk (Ben-Ner and Jones, 1995). Furthermore, employees would be averse to jeopardising either their less diversified retirement portfolio (consisting of significant amounts of firm stock) or their firm-specific human capital, which is less valuable in external labour markets. Thus, employees would be more likely to improve organisational efficiency.

Supporting the preference for stability and efficiency, employee ownership increases firm survival (*e.g.* Blasi *et al.*, 2013; Estrin and Jones, 1992; Iqbal and Hamid, 2000), productivity (Kumbhakar and Dunbar, 1993; Mitchell *et al.*, 1990; Park and Song, 1995) and organisational stability (Kruse, 2002; Kurtulus *et al.*, 2011). Furthermore, increasing employee ownership diminishes the focus on growth through reduced R&D investment and commitment to innovation (Gamble, 2000) and leads to a decreased focus on maximising value and greater preference for lowering risk (Faleye *et al.*, 2006). Recent work by Kim and Ouimet (2014) showed that increased employee ownership led to increased productivity and lowered growth.

Against this background, we pose the following research question:

Research Question 3. Is there a difference in the effects of employee ownership on efficiency versus growth related performance outcomes?

METHODS

Data description

We draw on studies across multiple disciplines to assess the effects of employee ownership on performance. Our search criteria covered all studies published in the English language. We entered a variety of search terms related to employee stock ownership (*i.e.* employee stock ownership, employee stock ownership plans, employee ownership, employee stock options and broad-based stock options) and firm performance terms (*i.e.* firm performance, return on

assets/equity, Tobin's q , growth, earnings, cumulative abnormal return and book-to-market ratio) into electronic databases (*i.e.* ABI Inform, ProQuest Dissertations and Theses and Google Scholar). We then reviewed abstracts of Academy of Management conferences between 2006 and 2013 and examined the reference sections of narrative reviews of employee stock ownership plans (*e.g.* Kruse and Blasi, 1995; Rosen *et al.*, 1990). Finally, we manually searched books and reports at the library of a major university located in the Midwestern USA. The manual search was restricted to the Library of Congress classification code range of HD4928.P62 (wages, stock option and employee stock options) and HD5660 (labour markets, labour supply and labour demand). The search was finalised in September 2013. We identified 592 citations⁵ potentially examining the relationship between employee stock ownership plans and firm performance.

Sample and inclusion criteria

Our first inclusion criterion was that articles needed to be quantitative studies and report a numerical relationship between an employee stock plan (*i.e.* stock ownership and stock options) and firm performance. The samples used in the target studies needed to include either a continuous measure of ownership (*e.g.* percentage of stock employees possessed) or a non-employee ownership comparison group. We excluded samples in which employee ownership was combined with other employee benefits into a single variable (*e.g.* a composite of profit sharing and stock ownership). The second criterion was that the stock ownership/options plan needed to be broad based; as such, we excluded studies in which the plan was restricted to executives. The third criterion was that the measure of performance needed to be fiscal (*e.g.* profit), at the firm level of analysis. Following Wood's (2008) detection heuristics, we identified and eliminated duplicate samples reported in two or more publications. A subsample of studies was coded independently by two of the authors, and Cohen's Kappa exceeded 0.90 indicating strong inter-rater reliability. Table 1 shows that among the 592 citations, our inclusion criteria resulted in a final sample of 102 studies from 14 countries. Table 1 also shows the types of plans we coded from different countries. Studies were most commonly excluded because they either (a) did not provide the necessary statistics to compute a correlation coefficient (*e.g.* means and accompanying standard deviations, standardised ordinary least squares regression coefficient and t -statistics); (b) did not estimate the ownership–performance relationship; or (c) grouped various types of employee participation (*e.g.* profit sharing and stock ownership) into one variable or included employees that did not acquire ownership (*e.g.* profit sharing where ownership is not transferred, but profits are shared). Coding for each study in the meta-analytic sample is available in Appendix A in the Online Supplement. Citations for studies included in the meta-analysis are available in Appendix B in the Online Supplement.

RESULTS

For Research Question 1, we coded the correlation or used equations from Hunter and Schmidt (2004) and Peterson and Brown (2005) to convert the reported effect sizes into correlations. For Research Question 2, we coded whether the firms in the sample were publicly held or private. For Research Question 3, efficiency included studies reporting productivity, labour productivity, return on assets, return on capital, translog production function and value-added productivity. Growth included studies reporting abnormal returns in the long term, market-to-book ratio, total stockholder returns, annualised market

returns and firm growth (sales, assets or profitability). For overall performance outcome, we included studies in which performance could not be classified under either efficiency or growth (*e.g.* net profit).

To control for the potential methodological artefact of when the study was carried out, we either coded the date of data collection (or year used in an archival data set) or the median year for time-series data.

Analytic technique

We drew from both Hunter and Schmidt's (2004) and Lipsey and Wilson's (2001) random-effects meta-analytic methods for the meta-analyses. The former was used for the overall meta-analysis between employee ownership and performance and calculating subgroup effect sizes (*e.g.* employee ownership within private firms). The latter was used for testing between-group differences and meta-regressions, as well as tests of publication bias. To conduct the meta-analyses, we weighted the effect sizes from each study in our sample based on the study's respective sample size. We used this information to compute an overall mean-weighted correlation that controls for sampling error in the primary studies (\bar{r}) and accompanying standard deviation for the mean-weighted correlations (SD_r). Because Hunter and Schmidt (2004) meta-analyses assume random effects, variance among the effect sizes can be partitioned into actual variance among effect sizes (*i.e.* due to moderators) and variance attributable to sampling error. Thus, we report the percentage of variance attributable to sampling error (%SE). In addition, we calculated and report 95% confidence intervals (CI) and 80% credibility intervals (CV) using formulae outlined in Whitener (1990). The 95% CI provides information regarding whether a particular effect size is significantly different from zero, and the width of the 80% CV provides information regarding whether the distribution of effect sizes in the population of studies includes moderators. For the proposed moderators, categorical moderators were tested with a between-group difference test, with the statistical significance of a moderator category indicated by the *Q* statistic. We tested continuous moderators (median year, percentage owned, 5-year journal impact factor and firm size) using unrestricted maximum likelihood meta-regression to regress the moderators on the study effect sizes and weighted each effect size by the inverse of the sampling error variance (Lipsey and Wilson, 2001). In these

TABLE 1 Country of origin for studies in meta-analytic database

Country of study	Total number of studies	Ownership	Options
Canada	1	—	—
China	2	2	—
Finland	2	—	2
France	3	3	—
Germany	1	—	1
Italy	3	3	—
Japan	5	5	—
South Korea	2	—	—
Malaysia	2	—	2
Poland	3	3	—
Singapore	1	—	1
Taiwan	1	1	—
United Kingdom	8	7	1
USA	68	16	52
Not reported	1	1	—

analyses, the statistical significance of the regression slope (β) indicates moderation by the associated variable.

Our analyses were based on 102 samples reporting on the effectiveness of employee stock ownership or employee stock option plans in 56,984 firms. The mean sample size was 558 firms, and the median was 155 firms. The disparity between the two measures of central tendency indicates a positively skewed distribution with larger studies pulling the mean upward. Although meta-analysis is not inherently biased by skew, Borenstein *et al.* (2005) recommended a 'one-study-removed' analysis to ensure that no single study plays an overly impactful role on the estimates. The one-study-removed technique is an iterative process whereby the meta-analysis is first run with all studies (or more specifically all samples) included except Sample 1 and then all studies included except Sample 2, and so on. If removing any single sample substantially alters the overall estimate (*e.g.* removing Sample 56 shifts the overall mean estimate from -0.05 to $+0.10$), then we might conclude this particular sample is an outlier or warrants greater scrutiny. We found that the overall mean estimate changed no more than 0.003 based on removing any one sample. Thus, we concluded that no sample, big or small, had an undue influence on the overall results.

In Table 2(a), the sample-size-weighted mean correlation between employee ownership and performance was 0.04, and the 95% CI did not include a zero (95% CI: [0.02, 0.05]). The 80% CV was quite narrow (80% CV: [-0.03, 0.10]), which indicates a fairly robust effect, but does not entirely rule out the presence of moderators. To test for moderation and answer Research Questions 2 (differences in effect size of public vs private firms) and 3 (differences in effect size of efficiency vs growth performance outcomes), we computed the effect size for each individual moderator category and accompanying 95% CIs. However, as shown in Table 2(a), firm type (public vs private) and performance operationalization (efficiency vs growth) were not significant moderators of the observed variance in the employee ownership–firm performance relationship ($Q_{\text{between}} = 0.80$ and 0.19 , respectively). Q_{between} follows a chi-square distribution, and its interpretation is similar to that of a Z-value. Thus, for both Research Questions 2 (*i.e.* public vs private ownership) and 3 (*i.e.* efficiency vs growth related performance outcomes), we find no difference.

Post-hoc analyses

In addition to the three research questions derived from extant theoretical work, we assessed variation in effect sizes based on design and sampling differences across studies. We began by assessing whether effects in studies drawing on samples of firms with pre-employee–post-employee ownership adoption differ from those in studies drawing on samples of firms only with employee ownership. We also investigated whether effect sizes differ between stock option ownership plans and traditional stock ownership plans, whether effect sizes differ between studies with US versus non-US samples and whether effect sizes vary with percentage employee ownership or number of employees in a firm. With more firms adopting employee ownership plans, we also explored whether effects sizes in studies have declined over time. Finally, we tested for publication bias. The aim of the post-hoc analyses was to further inform study design for future studies on employee ownership.

Pre–post and non-pre–post sample adoption We expect that the effects in studies on pre-employee and post-employee ownership adoption would be greater than effects in studies with only post-adoption employee ownership samples, or non-pre–post samples. We coded studies with a pre-employee–post-employee ownership effects and samples with only effects in firms

TABLE 2 *Meta-analytic estimates*

	<i>k</i>	<i>N</i>	\bar{r}	SD_{true}	95%CI	80%CV	%SE	<i>Q</i>
Employee ownership–performance [R1]	102	56,984	0.04*	0.05	0.02; 0.05	−0.03; 0.10	38	n/a
Type of firm [R2]								
Public	69	39,594	0.03*	0.04	0.02; 0.05	−0.02; 0.09	49	—
Private	21	5,932	0.02	0.05	−0.01; 0.06	−0.04; 0.08	62	0.80
Performance [R3]								
Performance	34	38,505	0.01	0.05	−0.01; 0.03	−0.05; 0.08	26	—
Efficiency	43	13,417	0.05*	0.07	0.02; 0.08	−0.04; 0.15	38	—
Growth	21	15,585	0.03*	0.02	0.01; 0.05	0.01; 0.05	84	0.19
Study Design								
Pre–post	23	7,218	0.06*	0.00	0.03; 0.08	—	100+	—
Non-pre–post	79	49,766	0.03*	0.06	0.02; 0.05	−0.04; 0.11	32	0.24
Type of plan								
Ownership	75	37,790	0.03*	0.06	0.02; 0.05	−0.04; 0.11	38	—
Options	25	18,448	0.04*	0.05	0.01; 0.06	−0.03; 0.10	35	1.21
Location of firms								
International	36	21,068	0.06*	0.08	0.03; 0.08	−0.04; 0.16	22	—
USA	66	35,916	0.02*	0.03	0.01; 0.04	−0.01; 0.06	72	5.00*
Publication status								
Journal article	61	28,128	0.05*	0.05	0.03; 0.06	−0.02; 0.11	48	—
Other	41	28,856	0.02*	0.06	0.00; 0.04	−0.05; 0.10	31	2.97
Predictor	<i>k</i>	β	SE	R^2	Q_{model}	$Q_{residual}$		
Model 1: Median year	96	0.35	0.00	0.12	10.88**	76.30		
Model 2: Per cent owned	37	−0.12	0.04	0.02	0.45	29.10		
Model 3: Ln (employees)	19	−0.11	0.01	0.01	0.19	18.13		
Model 4: 5-year impact	38	0.00	0.01	0.00	0.00	37.04		

(a) Correlation between employee ownership and performance and categorical moderator tests. (b) Tests of continuous moderation with mixed effects regression (unrestricted maximum likelihood).

Oper., operationalization; *k*, number of statistically independent samples; *N*, total sample size; \bar{r} , weighted mean correlation; SD_{true} , standard deviation of the population estimate; 95% CI, 95% confidence interval; 80% CV, 80% credibility interval; %SE, percentage of variance attributable to sampling error; *Q*, between-group difference test.

* $p < 0.05$.

k, number of statistically independent samples; β , standardised meta-regression coefficient; SE, standard error of unstandardized coefficient; R^2 , variance accounted for by model; Q_{model} , heterogeneity attributable to predictor; $Q_{residual}$, overall heterogeneity in model.

** $p < 0.01$.

with employee ownership plans. As presented in Table 2(a), we find that while effects are positive and significant for either type of study, the differences between these types of effects are not significant ($Q_{between} = 0.24$).

In addition to the correlation coefficient, we also computed the sample-size-weighted mean per cent difference in performance attributable to employee ownership. We did this for the studies in our database reporting the mean performance scores for employee ownership firms and other firms and for studies reporting the mean performance scores before and after an employee ownership scheme was implemented. Such an index provides an intuitive metric for the effect that employee ownership schemes have on firm performance. Of our database, 50 studies (36 employee ownership vs other firm studies; 14 pre–post studies) provided the necessary information to compute the per cent difference. We found that employee ownership

firms had performance scores 35% higher, on average, than other firms, and that implementing employee ownership schemes was associated with a 32% increase in performance, on average. We should note that these percentages are quite large relative to the magnitude of the correlation we found, which is likely because the effect sizes in our meta-analyses were commonly regression coefficients controlling for other relevant variables (e.g. firm size). These percentages, in contrast, do not control for other variables; as such, these percentages should be interpreted with caution.⁶

Type of employee ownership plan In recent work by Freeman *et al.* (2010), stock ownership and stock option plans are considered to be a part of shared capitalism. Although there are a wide variety of employee ownership plans, there could be a difference in effects between employee stock ownership plans versus employee stock option plans. Stocks are endowed immediately under stock ownership plans, whereas stock options are exercised only if stock price is at or above the strike price. As such, inter-temporal variation in ownership between the two modes of ownership could elicit different reactions. Stock options could increase risk-seeking as the value of option increases with higher firm volatility, whereas stock ownership increases loss aversion, because ownership is endowed immediately.

We classified broad-based plans as stock ownership or stock options based on the original authors' statements or descriptions (e.g. 'employees were allowed to purchase stock within 5 years for the 1998 price'). As documented in Table 2(a), both stock ownership and stock option plans were positively related to performance, but there was no significant difference in effect sizes ($Q_{\text{between}} = 1.21$).

Do effect sizes vary between US and non-US firms? Adopting employee ownership plans is driven by economic, cultural and institutional factors. In several European countries, employee ownership plans are adopted for altruism or benevolence toward employees. Elsewhere, in Asian countries, employee ownership is promoted because of greater collectivism. Comparatively, in the USA, greater short-term thinking among managers (Lavery, 1996) and greater arm's-length dealings with employees (Budd, 2010), employee ownership plans are motivated more by economic gains. The preponderance of data was drawn from the USA, but several studies were conducted in various locations around the world. Unfortunately, besides the USA, there was no specific country that contained a sufficient number of studies for a separate analysis; therefore, we could only compare the USA with the international community. We found that studies conducted in the USA were significantly different from studies conducted elsewhere. Specifically, studies carried out in the USA report a markedly weaker relationship between employee ownership plans and firm performance than those carried out internationally ($r_{\text{USA}} = 0.02$, $r_{\text{international}} = 0.06$, $Q_{\text{between}} = 5.00$, $p < 0.05$).

Is employee ownership a management fad? One of the concerns voiced in recent years is management fads (Ghemawat, 2002; Gibson and Tesone, 2001; Miller and Hartwick, 2002; Newell *et al.*, 2001). Managers could adopt employee ownership not for strategic reasons, but because of mimetic pressures and the bandwagon effect. If employee ownership practices do not aim to improve performance and are indeed fads, then effect of employee ownership on performance in empirical studies over the years should decline. However, if it is a viable management practice, then firms would learn to deploy it more efficaciously over time (Miller and Hartwick, 2002). In this case, the effects would increase or remain stable in studies conducted in more recent years than those conducted in past years.

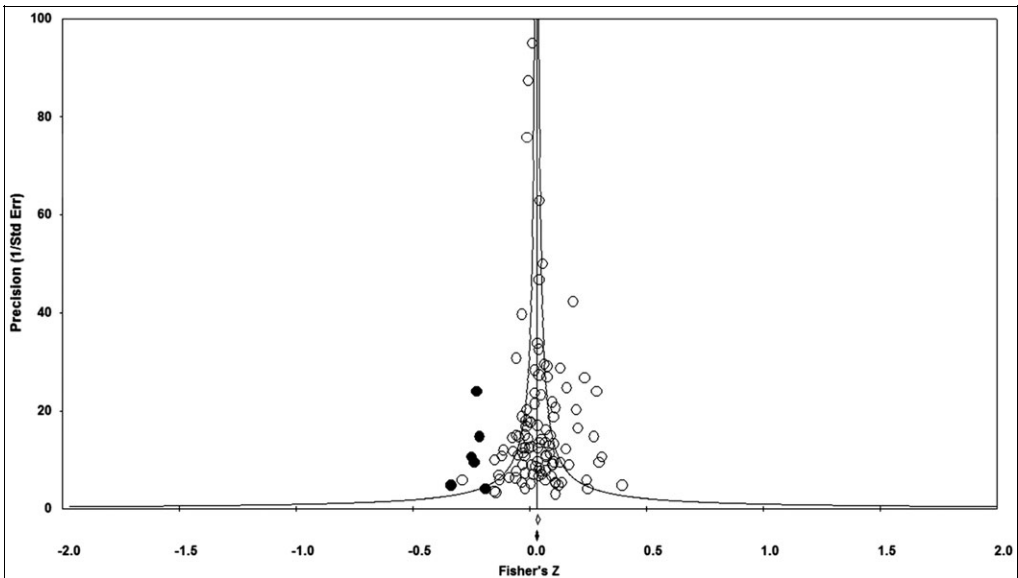
To test for this possibility, we coded a continuous variable of median year of observation when the years of data collection were reported in the study ($k=96$). To test this moderator, we regressed the correlation between employee ownership and performance from the relevant studies on the median year of observation while weighing each study by the inverse of the sampling error variance (Lipsey and Wilson, 2001). As shown in Table 2(b), the regression coefficient for year of study was significant ($\beta=0.35, p < 0.01$) and indicates that the effect of employee ownership on performance has increased over time. It is more likely, therefore, to be an organisational practice that has led to sustained improvements in performance than a management fad.

Percentage of employee ownership We tested whether increasing percentage of employee ownership increases performance. We coded studies that provided information on percentage employee ownership ($k=37$). As showed in Table 2(b), the percentage of ownership ($\beta=-0.12, p > 0.10$) was not a significant predictor of the employee ownership–performance relationship.

Is employee ownership more effective in firms with more employees? One source of variance in employee ownership effectiveness could be the firm’s size. To test this possibility, we regressed the effect sizes onto firm size (*i.e.* log number of employees). Our results are presented in Table 2(b). The relationship was negative, indicating that as firm size increased, employee ownership efficacy decreased, but the effect was not significant and explained only 1% of variance in employee ownership plans ($R^2=0.01$).

Test for publication bias Publication bias refers to systematic suppression of results that are counterintuitive or statistically non-significant. This results in a population of effect sizes that do not accurately reflect reality and are biased, usually in the direction of larger effect sizes that conform to the dominant theoretical paradigm in an area of study. Figure 1 depicts the funnel plot derived by plotting effect sizes on the x -axis and the precision (or inverse standard error) of the sample on the y -axis (Duval and Tweedie, 2000). Because sampling error is randomly

FIGURE 1 Test of publication bias. The x -axis is the effect size, and the y -axis is the precision (1/standard error). White circles are observed samples, and black circles are imputed studies



distributed, the plotted samples should make a symmetrical pattern with roughly half of the samples to the left of the mean effect size and half to the right. Samples with greater precision (*i.e.* larger sample size) suffer from less random sampling error and therefore, typically cluster close to the top of the funnel plot. Samples with less precision suffer from greater random sampling error and scatter throughout the base of the funnel plot. When publication bias is present, the funnel plot will be asymmetric and will appear as if samples are missing on one side. The funnel plot in Figure 1 shows that the distribution is slightly asymmetrical with six studies to the left that are potentially missing (shown as black dots). This indicates the potential for publication bias in that small sample studies that find negative relationships between employee ownership plans and firm performance are underrepresented in the population of studies. When asymmetry is found, the trim and fill technique will impute these six studies (*i.e.* treat the black dots or 'missing studies' as if they were observed effect sizes) and then evaluate whether the overall results change the 'missing studies' had been included. If the overall estimate changes when the six imputed studies are added to the analysis, then this provides evidence of potential publication bias. In the present study's case, the relationship with and without the six studies was identical to the third decimal place, with no change in effect direction or statistical significance.

Although our results are likely free from publication bias, it is still possible that the literature on employee ownership plans contains a bias toward positive results. This bias could manifest itself as a true deficiency bias (*i.e.* studies without positive results are systematically absent from the published literature) or as an availability bias, where the 'better' results are published in increasingly higher tier journals. To test for these two possible sources of misrepresentation in the literature, we first compared journal articles with other sources of data (*e.g.* dissertations, books and working papers). If the deficiency bias were present, we would expect to see smaller effect sizes in studies that have not gone through the peer review journal process. As shown in Table 2, we found that journal studies presented stronger results than non-journal studies ($r=0.05$ vs $r=0.02$, respectively), but the difference was not statistically different ($Q_{\text{between}}=2.97$). We refer to studies published in journals that are peer reviewed as well as non-journal studies, including book chapters, which are peer reviewed but not published journals. As such, we cannot reject the null hypothesis that this literature is free from bias. For the second possible source of bias, we regressed effect sizes onto 5-year journal impact factors. If there was a preference for large, statistically significant results, we would expect to see a relationship between effect size and journal impact factor. As shown in Table 2, however, we found no evidence of preferential publication for more positive results ($\beta=0.00$). In sum, the evidence for publication bias is not particularly compelling, and the estimates presented in Table 1 are likely free from this form of bias.

DISCUSSION

Our meta-analysis of 102 studies representing 56,984 firms from around the world found a small but significant effect of employee ownership on firm performance ($\bar{r}=0.04$). Although small, it should be noted that even small effects can lead to large increases in the dollar value of firms. For example, our results suggest that a firm with \$1 million in profits could realise an increase of \$40,000. The results show no difference in performance effects for public versus private firms or for samples with pre-adoption and post-adoption effects versus samples of firms with ongoing employee ownership plans. Furthermore, the effects of employee ownership are not significantly different for efficiency or growth-related outcomes. No evidence of publication bias lends further credibility to the results. Also encouraging in post-hoc analyses are the findings

that the effects of stock ownership plans versus stock option plans on performance are not significantly different. Further interesting is the finding that the effects in US samples are weaker, albeit still significant, than in international samples. In the current meta-analysis, we focused on the relationship between employee ownership and firm-level performance. Because we were unable to identify sufficient studies with employee-level outcomes, we were not able to test these individual-level effects. Nevertheless, current research on employee behaviours such as commitment, effort, monitoring and lower turnover intent is indirectly consistent with higher performance on firms with employee ownership (Blasi *et al.*, 2008).

Related to the conjecture on employee ownership as a management fad (Ben-Ner and Jones, 1995), it does not seem that the effects of employee ownership on performance have declined over time. Instead, reported effects in studies have become stronger over time. Past work has proposed that there are economies of scale and scope in adopting employee ownership in larger firms. However, the number of employees was not a significant moderator in the relationship between employee ownership and firm performance. Because higher-tier journals could seek studies demonstrating stronger effects to support past theories, we tested whether journals with higher impact factors would publish studies showing stronger effects of employee ownership. We did not find support for such a bias, thus discounting the possibility that higher-tier journals have systematically published studies reporting higher effects.

Implications and avenues for future studies

Our findings provide several directions for future research and have implications for future research on employee ownership. In Table 3, we identify the theoretical areas that could be used to further develop this stream of research.

Employee ownership and firm performance During its early years, some labour economists celebrated employee ownership, whereas others questioned it. Although a steady stream of empirical studies has emerged over the decades, efforts toward developing a theoretical framework have been limited (for exceptions, see Buchko, 1992; Pierce *et al.*, 1991). Notably, Kaarsemaker and Poutsma (2006) and Kruse (2002) have called to integrate employee ownership into broader management theories such as high performance HR practices or theories on employee-level micro-dynamics. Future studies could further test for variations in the effects of employee ownership on firm performance based on differences in HR practices, firm-specific human capital or strategic orientation of the firm.

Employee ownership could strengthen the effects of high performance work practices on firm performance through improved recruitment and selection of employees (D'Art and Turner, 2004), greater participation (Klein, 1987), increased commitment (Klein, 1987) and greater flexibility (Kruse, 2002). Gerhart and Rynes (2003) and Gerhart *et al.* (1995) proposed that employee compensation plans have a Thorndike's Law of Effect, which indicates that high performance followed by monetary rewards (of higher ownership) improves future performance. They also propose the role of expectancy theory where expectations of higher future rewards increase current efforts. Employee ownership may also lower perceptions of inequity in reward–contribution ratio and improve employee motivation (Gerhart *et al.*, 1995). Future studies could further test for complementary effects of employee ownership and HR practices. Drawing on the resource-based view, firms aim to develop the knowledge, skills and abilities of its employees to improve performance. Higher ownership levels could lead employees to make higher investments into developing their human capital. Employee ownership could also influence the motivation to participate and maintain intensity and sustained duration of effort to contribute to the firm.

TABLE 3 Implications of the findings for future theoretical development

Research Question	Finding	Inference	Theoretical development	Theory
Research Question 1 (employee ownership is positively related to performance)	Significant effects, but narrow CV	Narrow CV indicates that effects of employee ownership are less conditional on contextual firm-related factors	<ul style="list-style-type: none"> Employee ownership is less contingency based. Employee ownership has more universalistic support Effects of employee ownership would be stronger through participation and training. Principals aiming to lower agency costs under diffuse ownership in public firms may not realise significant performance improvements Lack of liquidity of stock in private firms is not a hindrance for its employees in investing in human capital, participation or motivation. Economies of scale are less likely with employee ownership in larger public firms Employee ownership as an ambidextrous HR practice that allows pursuing both growth and efficiency 	<ul style="list-style-type: none"> Contingency theory vs Universalism theory Sociological theory Agency theory Liabilities of smallness Economies of scale in HR practices
Research Question 2 (Effects are stronger in public firms than in private firms)	No significant difference	Public firms do not realise higher gains than private firms when using employee ownership	<ul style="list-style-type: none"> Employee ownership in larger public firms Employee ownership as an ambidextrous HR practice that allows pursuing both growth and efficiency 	<ul style="list-style-type: none"> Organizational Ambidexterity literature
Research Question 3 (Effects are stronger for efficiency instead of growth)	No significant difference	Employee ownership facilitates both efficiency and growth-oriented outcomes	<ul style="list-style-type: none"> Employee ownership motivates employees under varying organisational goals Employee ownership is possibly an institutionalised practice with continued influence on firm performance 	<ul style="list-style-type: none"> Adaptive organisational practices Institutional theory
Effects in pre-post studies are stronger than effects in post-implementation studies	No significant difference	The benefits of employee ownership do not seem to decline over time	<ul style="list-style-type: none"> Stocks increase loss-aversion or risk-aversion and stock options increase risk-seeking. However, neither incentive mechanism has a stronger impact than the other Limited gains from aggregation effects from a large number of employees Liabilities of smallness are limited for small firms when implementing employee ownership Efficacy of shared capitalism in increasing firm performance is lower in US firms. 	<ul style="list-style-type: none"> Risk bearing and micro-ownership Aggregation effects of organisational practices Liabilities of smallness Institutional theory
Whether effects of employee ownership on performance have changed over time	Reported effects of employee ownership across studies have remained steady over time	Effects of employee ownership have remained steady over time		
Whether there are differences in effects of stock ownership and stock option ownership plans on performance	No differences in effects of stock ownership and stock options-based ownership plans on performance	Stock versus stock options do not have differential effects on performance		
Whether gains in employee ownership are higher for larger firms (measured as number of employees)	Impact of employee ownership is not stronger in larger firms	'Scale' economies from employee ownership are not present in larger firms		
Whether effect size is stronger in US samples vs international samples	Effects of employee ownership on performance were weaker in US samples than in international samples.	Possible cultural and institutional differences in US firms could limit effect of employee ownership on performance		

Although we take a financial economics perspective in developing our research questions, the sociological implications of employee ownership must not be overlooked. The sociological lens is critical to understanding the formal and informal structures undergirded and supported by employee ownership.⁷ Aggregating employee ownership from the micro-level to meso-level is facilitated by employee ownership participation in job decisions and by both job-related and employee ownership-related training (Freeman *et al.*, 2010; Kruse, 2002; Rosen *et al.*, 2005). Such social exchange structures provide a social ecology that promotes trust, cooperation and social capital among employees. In addition to financial economics and organisational psychology lens, sociological lens could further help open the black box between employee ownership and firm performance.

Public versus private firms Financial economists have long touted governance benefits in public firms versus those of private firms. Public firms with better resources and capabilities than private firms could better complement employee ownership to realise higher gains. The results, however, show that the relative difference in effects between the two types of firms is marginal. As Freeman *et al.* (2010: 3) stated, 'plausible risk-aversion parameters' are greater in private firms because of limited 'thickness of asset markets.' The lack of significant differences in effect sizes also indirectly debunks the supposed reticence of private firm employees in investing in their human capital because of liquidity concerns. Given there are no meaningful differences in effects, these costs of limited liquidity and lower diversification are less plausible. Based on Bova *et al.* (2015), employee ownership could therefore have positive externalities such as lower likelihood of fraud, higher corporate social responsibility and higher ethical conduct. Future studies could focus on these additional avenues of research.

Impact on efficiency versus growth Agency theory proposes that compensation is a strategic lever for a firm to increase performance (Harden *et al.*, 2010). Studies have indicated that because employee ownership leads to sharing profits and losses, it may elicit risk aversion from employees, resulting in a greater focus on the reliability of performance and not on performance growth. Because gains and losses are shared jointly, employee ownership could stifle sorting (Lazear, 2000), with more capable employees having reduced incentive to share performance gains with others. The resulting 'team-based' compensation could increase free riding (Bonin *et al.*, 2007). Therefore, it is expected that employee ownership could reduce risk-taking, increase focus on productivity and improve reliability in performance. Significant results for both efficiency and growth signal the potential adaptive capability of employee ownership (*i.e.* the firms' ability to maintain efficiency while pursuing growth) to pursue change and stability (Farjoun, 2010). Future studies could explore whether firms with high levels of employee ownership realise higher performance in unpredictable and unstable environments.

Type of plan Work in financial economics has shown that stock ownership and stock options elicit different actions from employees. Employee stock ownership may increase preferences for organisational stability and efficiency (Blair *et al.*, 2000; Kurtulus *et al.*, 2011). Stock options, in contrast, increase risk-taking, as option value increases by increasing stock price and/or stock volatility. While this logic is prevalent in financial economics, when considered through the lens of employee ownership, we do not find significant differences between the two plan types.

Effects in US versus international samples The results show that the effect size for samples of US firms, although positive, is lower than the effect size in international samples. Future studies could explore further whether institutional and cultural differences impact gains from employee ownership plans. Institutional and cultural factors could explain not only interactions among employees but also their general attitude toward the firm. Cross-country differences on the impact of employee ownership on firm performance remain unexplored.

Also of interest is the unique US context. The economic history of US firms generally shows a slant toward Taylorian principles of management and arm's-length type of exchanges with employees (Budd, 2010; Freeman *et al.*, 2007). Firms in the USA have high involuntary turnover rates, and 'hire and fire' policies are prevalent; although firms do gain from employee ownership ($\bar{r}=0.02$), the gains are significantly lower than non-US firms ($\bar{r}=0.06$). However, the wider the CV for US firms (80% CV: [-0.03, 0.10]) indicates that there could be additional moderators explaining differences in gains from employee ownership. Such moderators could include practices that strengthen the bond between employees and firms such as HR practices, organisational culture and supportive climate, among others.

Modelling for endogeneity in future studies Finally, employee ownership studies are typically cross-sectional and lack a clear identification strategy. However, about a fifth of the studies in the current sample use a pre-post design, and the results do not show a difference in estimates between pre-post and post-only designs. While causality cannot be assumed, pre-post designs control for selection bias (*e.g.* high performing firms are more likely to adopt employee ownership), and the pre-post design provides more reliable inferences by controlling for pre-adoption performance. The endogeneity stems from both simultaneity and unobservables in the error term. Firms with higher performance may reach limits to recombining existing resources and could allocate resources toward enhancing employee participation and human capital by offering employee ownership. When firm performance increases, employees may also question whether they are receiving their fair share and may require additional incentives such as employee ownership; therefore, the possibility exists of reverse causality from performance to employee ownership. Organisational culture, employee HR practices, employee commitment and several other factors could affect adoption and the degree of employee ownership. The endogeneity issue in most of the studies indicates that only correlation be assumed and not causality. Future studies could identify exogenous events such as law changes that could provide a robust identification approach.

LIMITATIONS

As with all studies, the present study has several limitations. First, there is a possibility of bias in sampling bias in sampling where employees in ownership firms are less likely to respond than employees in non-ownership firms. Among the pool of employees, employees most influenced by employee ownership may also be more likely to respond. Therefore, selection bias may exist both at the firm and employee levels. We call on future studies to control for selection bias effects. Furthermore, because financial outcomes are distant and there remains a large unexplored black box between employee ownership and performance (Caramelli, 2011), we call on future studies to assess these intervening factors that could explain the correlational or causal chain between employee ownership and performance.

Second, studies examining factors such as employee participation, autonomy and motivation were quite limited; therefore, we could not test how these factors and many others might moderate the overall relationship. It is possible that including such effects could change the direction or significance of the effects.

Third, although meta-analysis is a powerful tool, it does embody some important limitations. For example, when there is ambiguity in either the predictor (*i.e.* employee ownership) or criterion (*i.e.* firm performance), the aggregated results of a meta-analysis can be contaminated by studies and effect sizes that do not represent the true population (Cooper, 2009). There are several competing views on what constitutes firm performance (Mackey *et al.*, 2007) and what constitutes employee ownership (Kruse *et al.*, 2010). To address the construct

ambiguity, we were very conservative in our approach and only selected studies in which the variables of interest clearly met our definitions. On the one hand, this reduced excessive variance because of contamination factors, but on the other hand, it limited our ability to generalise across all forms of performance (e.g. corporate social performance) and across all forms of indirect compensation (e.g. profit sharing plans).

A final limitation worth noting is that meta-analyses in micro-oriented fields (e.g. psychology and organisation behaviour) typically deal with normally distributed data, with the most common method of analysis being ordinary least squares regression. These two factors make effect size conversions (e.g. means and standard deviations to correlations) a straightforward process. Unfortunately, with many firm-level outcomes, this conversion is problematic for several reasons. First, it is not nearly as stable as skewness. Second, kurtosis heavily biases transformations that assume normality (Hotelling and Pabst, 1936). Third, conversion equations for many forms of regression (e.g. Tobit, weighted least squares) are not available. For these reasons, we were forced to eliminate several studies that did not report necessary information to conduct the needed transformation into a correlation.

In closing, by drawing on studies from multiple disciplines that include samples from firms around the world, the present meta-analysis provides more generalizable inferences on the role of employee ownership on performance.

Notes

1. For brevity, we refer to privately held firms as private firms, and publicly held firms as public firms.
2. We thank an anonymous reviewer for this suggested typology.
3. However, such benefits as tax breaks have declined in recent years in the USA, and public firms may not be at the same advantage as they were in 1980s.
4. We thank an anonymous reviewer for this suggestion.
5. We are extremely grateful for the assistance of an anonymous reviewer in identifying additional sources of data.
6. We thank an anonymous reviewer for suggesting these analyses.
7. We thank an anonymous reviewer for this suggestion.

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