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Employee stock ownership and firm exit decisions: A cross-country analysis of rank-and-file employees

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ABSTRACT

While multinational firms invest large amounts of money in employee stock ownership plans (ESOPs) to reduce turnover, there is little evidence regarding ESOPs' effectiveness in retaining rank-and-file employees and none on a global scale. Building on psychological ownership (PO) arguments, we predict that a rank-and-file employee's ESOP participation will be negatively associated with a firm exit decision and that this effect will be stronger in contextual settings that are more conducive to turnover. For our analysis, we used internal data from a large multinational firm covering 190,453 rank-and-file employees and approximately 650,000 employee years. We find that ESOP participation is associated with a lower likelihood of individual firm exit decisions. We also find this effect to be more pronounced in countries with favorable labor market conditions and lower uncertainty avoidance (UA). Additional tests support our argument that PO arising from ESOP participation is particularly important for rank-and-file employees, who often only invest small amounts. Overall, our study provides cross-country evidence regarding the retention effect of ESOP participation for rank-and-file employees.
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1. Introduction

As the estimated turnover cost averages 150% to 175% of a leaving employee's annual pay (Hansen, 1997), firms are intensely interested in retaining employees. To provide incentives for employees to stay with their current employer, firms are increasingly turning to employee stock ownership plans (ESOPs)[1] (GEO, 2019). While prior empirical studies rely on economic arguments to explain the retention effect arising from stock ownership mostly for higher-level managers (e.g., Aldatmaz, Ouimet, & Van Wesep, 2018; Balsam & Miharjo, 2007; Oyer & Schaefer, 2005), we question whether there could be other retention arguments for rank-and-file employees with significantly smaller ESOP investments. To answer this question, we use data on individuals' participation in a broad-based ESOP from a large, multinational firm that allows its rank-and-file employees to invest only as much as 5% of their income.[2]

From a theoretical point of view, stock-based compensation provides incentives to align the interests of employees with those of their employers. Thereby, the extant literature has mostly focused on executives and explained their behavior through economic arguments (e.g., Balsam & Miharjo, 2007; Guay, Core, & Larcker, 2003). Studies based on the entire workforce (i.e., including lower hierarchical levels) have adopted these economic arguments when examining the effect of ESOPs on overall turnover behavior (Aldatmaz et al., 2018; Balsam, Gifford, & Kim, 2007). We, however, provide an alternative explanation based on psychological theory to further elucidate the behavior of rank-and-file employees. In contrast to compensation for executives and senior managers, stock-based compensation for rank-and-file employees

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[1] Generally, ESOPs offer stock ownership to employees at privileged terms (e.g., Poutsma & de Nijs, 2003). However, ESOPs' characteristics vary substantially between countries and firms (e.g., Jones & Kato, 1995). The focal firm's ESOP is offered to employees on all hierarchical levels (exclusions apply, for example, to temporary employees) and thus qualifies as broad-based (Kim & Ouimet, 2014). For a detailed description of the ESOP, see Section 3.

[2] However, on average, rank-and-file employees in the firm invest a lot less than 5% of their income. Based on data for 2018, the average rank-and-file employee invested only 2.25%. Given the median annual income of €52,083, 5% translates into €2,604, and 2.25% into €1,172.

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makes up significantly smaller amounts and fractions of their salary and is far less frequent (Edmans, Gabaix, & Jenter, 2017; GEO, 2019). Above and beyond the economic arguments, we argue that the desirable effects of ESOPs for rank-and-file employees are likely to unfold through the concept of psychological ownership (PO) (Dawkins, Tian, Newman, & Martin, 2017; Pierce, Rubenfeld, & Morgan, 1991).

This paper builds on the long-standing literature on PO spanning organizational behavior, psychology, and management research (e.g., Pierce, Kostova, & Dirks, 2003, 2001; Chi & Han, 2008; Dawkins et al., 2017; Pierce et al., 1991). PO describes a state in which "individuals feel as though the target of ownership or a piece of that is 'theirs' (i.e., 'It is mine!')" (Pierce et al., 2003, p. 86). In contrast to legal ownership, "[PO] consists of an emotional attachment to the target" that does not depend on the economic evaluation of the target (Dawkins et al., 2017, p. 164). However, as the state of PO is reached through feelings of investing in the target, having power and control over the target, and knowing the target, the existence of legal ownership (i.e., ESOP participation) can facilitate and accelerate the emergence of PO (Pierce et al., 2003; Pierce, O'Driscoll, & Coghlan, 2004). In contrast to rank-and-file employees, higher-level managers experience these feelings more often in their daily business and already possess a stronger feeling of PO even without an ESOP. Hence, ESOP participation should be particularly effective in building PO and, consequently, retention among rank-and-file employees, while for senior managers, the financial aspects of ESOPs could be more important.[3] Thus, we expect rank-and-file employees' ESOP participation to be associated with a strong attachment to the firm through PO, thus reducing the likelihood of a firm exit.

We further investigate specific contextual settings, to better understand how increased PO from ESOP participation relates to retention effects. Thus, we draw on the concept of employees' perceived ease of movement, which has often been used in the prediction of voluntary turnover (e.g., Gerhart, 1990; March & Simon, 1958; Trevor, 2001). We argue that ESOP participation is less effective in retaining employees when the intention to leave the firm is weak (i.e., low perceived ease of movement). In contrast, when the perceived ease of movement is high, ESOP participation should be more effective in retaining employees. Following prior literature about the characterization of the perceived ease of movement as general job availability and individual attributes, we consider measures of (1) the unemployment rate and (2) uncertainty avoidance (UA) (Allen, Weeks, & Moffitt, 2005; Trevor, 2001): First, when labor market conditions are good and employees are faced with many outside opportunities (i.e., perceived ease of movement is high), we expect the retention effect of ESOP participation through PO to be more pronounced. Second, as job changes entail uncertainty, we expect the retention effect of ESOP participation via PO to be stronger for employees with lower UA (i.e., perceived ease of movement is high).

To test our predictions, we use internal firm data from a large multinational industrial firm that is headquartered in Europe and has subsidiaries worldwide. The firm introduced a broad-based ESOP on a global scale in the late 2000s, and, since then, it has offered its employees the possibility of purchasing shares each year. The data contain detailed information about all eligible employees, their demographics, and their ESOP participation behavior. The research design benefits from firm-level effects being held constant, which enables us to better isolate the effects of our country-level moderators. On the country level, we combine the data with values for the unemployment rate from the World Bank and for UA from Hofstede (1984, 1994). We consider these country-level measures as they are closely tied to the theoretical concept of employees' perceived ease of movement. The final sample includes 654,706 employee observations for 190,453 unique employees in 39 countries from 2011 to 2015. In our empirical analysis, we address endogeneity concerns by using both ordinary least squares (OLS) and two-stage least squares (2SLS) regressions – in the main model as well as in all additional analyses. The results are consistent with our predictions. In particular, we find a negative effect of ESOP participation on firm exit decisions of rank-and-file employees, which is stronger in countries with favorable labor market conditions and lower levels of UA. While the Hausman test suggests the existence of endogeneity, the calculation of the impact threshold for a confounding variable (ITCV) indicates that it is rather unlikely that an omitted variable has confounded our results.

We perform a number of sensitivity tests, in which we further address endogeneity concerns. First, we account for differences in observable characteristics and conduct a propensity score matching (PSM) analysis. Second, we exclude employees with specific knowledge about the ESOP. Third, in an extension of the 2SLS regressions, we control for potentially confounding country-level effects in the first- and second-stage regressions. These tests consistently support our main results.

In additional tests, we substantiate our arguments on the relevance of PO arising from ESOP participation for rank-and-file employees. First, we exploit survey data and find significant correlations between ESOP participation and PO-related responses. Second, we conduct subsample analyses stratified by groups that vary in experiencing PO in their daily business and find the retention effect arising from ESOP participation to be more pronounced for employees with less pre-existing PO (e.g., new employees). Third, we investigate the retention effect of very small ESOP investments that are hardly likely to be an economic motivator, but that contribute to PO, and find negative and significant relations with firm exit decisions. Fourth, while economic motivations expire with the vesting period, we find that the ESOP's retention effect for rank-and-file employees holds beyond the vesting period, again suggesting PO to be the underlying mechanism.

Our study contributes to the literature in several ways. First, we extend prior research investigating the effect of ESOP participation on employee behavior (Aldatmaz et al., 2018; Balsam et al., 2007; Pierce et al., 1991) as we provide empirical evidence for ESOPs' retention effect for individual rank-and-file employees, a concern at the heart of any firm's management control system. In contrast to prior studies that either used firm-level data (Aldatmaz et al., 2018), investigated broader groups of employees, including those on higher levels (Aldatmaz et al., 2018; Balsam et al., 2007), and that deducted propositions from conceptual models (Pierce et al., 1991), we observe the effect of individuals' ESOP participation on the firm exit decisions of rank-and-file employees while controlling for their demographics and job characteristics. In this vein, the analysis on the individual level improves our understanding of actual behavior as recently called for by Hanlon, Yeung, and Zuo (2021), especially regarding investment (e.g., Babenko & Sen, 2014) and firm exit decisions (e.g., Trevor, 2001).

Second, our study fits within a growing body of accounting research that investigates the incentive effects arising from ESOP participation among rank-and-file employees (Call, Kedia, & Rajgopal, 2016; Holderness, Huffman, & Lewis-Western, 2019). We add to this stream of research by proposing a retention effect based on behavioral arguments using the theory of PO. PO seems

[3] Similarly, studies have shown that relationships between legal ownership and organizational identification as well as organizational identification and turnover are particularly pronounced for lower-level employees (Cole & Bruch, 2006; French & Rosenstein, 1984).

particularly applicable for rank-and-file employees who only have minor levels of legal ownership in their firms, thus giving greater relevance to their psychological attachment to organizations. Moreover, rank-and-file employees typically invest themselves to a smaller extent in their firms, exert only little power and control, and have less information about the firm in contrast to higher-level managers. This gives rank-and-file employees less experiences in developing a sense of PO in their daily business routine. Therefore, minor levels of legal ownership resulting from ESOP participation can already be effective in building PO among rank-and-file employees. Thereby, we also extend the literature on PO that previously primarily focused on firm-specific human capital (knowledge), employee empowerment (delegation of responsibility), and employees' investment of the self into the job (e.g., in form of time, energy, creativity, and judgement) (Pierce, Kostova, & Dirks, 2001; Zhang, Liu, Zhang, Xu, & Cheung, 2021).

Third, we add to the literature on ESOPs by examining their retention effect across different countries. Thereby, we extend prior empirical studies in the field that have exclusively focused on US firms (Aldatmaz et al., 2018; Balsam & Miharjo, 2007; Kim & Ouimet, 2014; Oyer & Schaefer, 2005). Based on a cross-country setting, the results reveal the differing effectiveness of ESOP participation at retaining employees under varying labor market conditions. In this vein, we also shed light on the substitutive nature of social control mechanisms, such as cultural norms and PO, in mitigating employees' turnover intentions. At the same time, the results demonstrate that the retention effect of ESOP participation holds on a global scale.

2. Literature review and hypotheses development

2.1. Literature on stock-based incentives and firm exit

In the last few decades, the economic literature has increasingly studied stock-based compensation as an instrument to resolve agency problems (Core & Guay, 1999; Haugen & Senbet, 1981; Prendergast, 1999). The literature has focused on the great importance of incentivizing executives and senior managers as corporate decision makers who significantly affect shareholders' wealth (e.g., Dechow & Sloan, 1991). A much studied element of compensation schemes has been the vesting period that aims to align interests—and specifically time horizons—by providing incentives to stay with the firm (Balsam & Miharjo, 2007; Cadman, Rusticus, & Sunder, 2013; Guay et al., 2003). In order to provide economic incentives and influence behavior (i.e., to create a retention effect), stock-based compensation linked to the vesting period has reached substantial amounts and frequently makes up more than half of the executives' compensation (Edmans et al., 2017; Murphy, 1999). Given that firms are increasingly offering stock to employees on the lower hierarchical levels (Core & Guay, 2001), the question arises as to whether significantly smaller proportions of stock—and smaller economic benefits—are able to retain rank-and-file employees.[4]

A common challenge for empirical studies investigating lower-level employees is the availability of adequate data. Thus, as opposed to studies on stock ownership and turnover at higher levels, there is little research on the lower levels. A recent empirical study by Aldatmaz et al. (2018) addresses the data challenge by approximating the average value of stock option grants for all employees minus the top five executives with ExecuComp data, which they combine with data on total employee turnover counts per establishment. In their analysis, Aldatmaz et al. (2018) find indications of a negative relationship between large ESOPs and total firm exits during the vesting period that was stronger in up markets. In their case study of a Fortune 100 firm, Balsam et al. (2007) examine three broad-based ESOP offerings during the 1990s and how they affected the turnover behavior of a broad group of employees. Balsam et al. (2007) find significant differences in turnover rates in the six months prior to and after the option vesting date, while also considering limited individual data.

Our study differs from these studies in fundamental ways. First, our study analyzes the effect of individuals' ESOP participation on the individual firm exit decisions of rank-and-file employees, which is significantly different from the effect of firm-wide ESOP offerings. Paired with information on demographics and job characteristics, this allows us to develop a better understanding of how ESOPs work by observing effects on an individual level by abstaining from observations and measurements based on average characteristics of broader employee groups.[5] For example, we are able to address concerns that the retention effect of ESOP participation is limited to certain subgroups with specific characteristics such as those with ESOP-relevant knowledge (e.g., employees in the Finance and Human Resources (HR) Departments). Second, the individual-level data enables us to exclude executives and senior managers in order to precisely narrow our focus down to rank-and-file employees. In this way, we are able to analyze the behavior of the largest employee group within firms without confounding effects from other employee groups. Third, given the exclusive focus on employees with lower incomes, we propose a psychological motivation besides an economic motivation as the mechanism behind the retentive ESOP effect. The focal firm's ESOP supports this mechanism, as it involves only small investments and physical share ownership, turning participating employees into actual shareholders. As shareholders, ESOP participants also receive voting rights, giving them increased levels of perceived power and control over the firm. This experience is a crucial trigger for the sense of PO. Fourth, the global scale of our study extends the prevailing focus from US establishments in previous studies to a cross-country setting. At the same time, our study benefits from potentially confounding firm effects being held constant, thus resulting in a thorough cross-country analysis.

2.2. The relevance of psychological ownership for rank-and-file employees' firm exit decisions

Rank-and-file employees' stock-based compensation accounts for a significantly smaller amount as well as proportion of their compensation in comparison to executives and senior managers (GEO, 2019). While stock-based compensation commonly makes up more than 50% of executives' compensation (Edmans et al., 2017), rank-and-file employees' common annual ESOP investment in the focal firm is 2.25% of their income, even reaching values as low as 0.01%.[6] This raises the question as to whether there are plausible alternative explanations for rank-and-file employees beyond the economic incentives that have been found to affect the firm exit behaviors of executives as well as broader groups of employees,

[4] In a similar vein, Hall and Murphy (2003) question employees' economic incentives arising from financial gains through stock ownership.

[5] For firms, it is important to gain knowledge about the ESOP participation behavior of employee subgroups with specific characteristics, for example, highly qualified employees or groups who rarely participate. As ESOP participation decreases the likelihood of a firm exit, firms could tailor their communication to these groups to foster their participation and thereby reduce the total number of firm exits.

[6] The firm provides employees with the possibility of acquiring fractional shares and has not set a minimum threshold for ESOP investments in many countries. Thus, even employees with very low incomes or those in financial distress can find ways to benefit from the ESOP.

including senior managers. We draw on the concept of PO to offer an alternative explanation for the potential relationship between ESOP participation and rank-and-file employees' firm exit decisions.

PO describes a feeling of an emotional attachment to the target, where individuals have a state of mind in which they perceive the target or a piece of it as theirs (Dawkins et al., 2017; Pierce et al., 2001). In their seminal paper, Pierce et al. (2001) describe how members of an organization come to feel PO: (1) investing in the target, (2) controlling the target, and (3) knowing the target. In day-to-day business, these experiences are more likely to occur for senior managers who can exert power over the firm and hold more information-intensive positions. In contrast, rank-and-file employees possess less control over the firm and are frequently confined to a more specific task that includes less information sharing and gathering. In addition to that, senior managers and rank-and-file employees differ substantially in their experiences regarding their investments in the firm. Frankly, senior managers are likely to develop a stronger sense of PO based on their daily business routines, while rank-and-file employees lack these experiences and are less likely to feel PO.

Prior research explicitly points to employee stock ownership as a driver of rank-and-file employees' PO and argues that stock ownership "leads to psychological ownership, a bonding or integration of the employee-owner with the organization" (Pierce et al., 1991, p. 121).[7] More precisely, ESOP participation in the focal firm helps to create all three experiences of how rank-and-file employees can come to feel PO. First, through ESOP participation, rank-and-file employees literally invest in the target (i.e., the firm). Second, as ESOP participation implies the purchase of physical stock from the employing firm, rank-and-file employees come to possess controlling shareholder rights (i.e., voting rights in annual meetings).[8] Third, as shareholders, rank-and-file employees have a higher demand for business-related information. Empirical studies indeed find a positive relation between employee ownership and PO (Chi & Han, 2008; Chiu, Hui, & Lai, 2007). Chi and Han (2008) report that employee participation in profit sharing has a positive effect on PO, while Chiu et al. (2007) document such an effect arising from employees' ESOP participation. While we assume rank-and-file employees will have less PO-building experiences in their daily business routines, their feeling of PO arising from ESOP participation should hence be particularly strong. Similarly, studies find the relationship between employee ownership and organizational identification to be stronger for lower-level employees (Cole & Bruch, 2006; French & Rosenstein, 1984).

However, as the observed ESOP investments of the rank-and-file employees are quite small, the question arises as to whether the amounts are substantial enough to affect behavior. Based on economic arguments, we might expect no or a small effect due to the low financial gains. Based on psychological arguments, we assume their sense of PO to depend less on the investment amount (Dawkins et al., 2017).[9] Derived from our explanations above, we expect ESOP participation to lead to strong identification with and attachment to the firm (Pierce et al., 2001). In this sense, ESOP participation triggers an expression of and contributes to employees' self-identity (Dawkins et al., 2017), evoking a sense of belongingness in terms of "having a place in which to dwell" (Pierce et al., 2003, p. 88). Where individuals strongly identify themselves with their firm, they are likely to align their behavior with the firm's interests (Abernethy, Bouwens, & Kroos, 2017). Similarly, organizational research suggests that PO and organizational identification are particularly effective in reducing turnover intentions at lower hierarchical levels (Abrams, Ando, & Hinkle, 1998; Cole & Bruch, 2006). This is in line with the PO literature that suggests a perceived responsibility and increased accountability of the employee for the employing firm (Avey, Avolio, Crossley, & Luthans, 2009; Dawkins et al., 2017; Van Dyne & Pierce, 2004). Thus, the PO consequences emerging from ESOP participation should attach the rank-and-file employees to the firm and reduce the likelihood of a firm exit:[10]

H1. *ESOP participation is negatively related to rank-and-file employees' individual decision to leave the firm.*

2.3. The influence of country-level factors on employees' perceived ease of movement

Rank-and-file employees' evaluation of the ESOP investment and their attachment to the firm is likely to vary depending on contextual settings, as is the relationship between ESOP participation and the firm exit decision. To dive deeper into the retention effect of ESOPs, we draw on the concept of perceived ease of movement, which is frequently applied to predict voluntary turnover (Gerhart, 1990; Trevor, 2001; Wu & Chi, 2020). Accordingly, we assume that a low perceived ease of movement is associated with a reduced likelihood of firm exit. Thus, in these situations, employees are generally less likely to leave the firm, and the need for ESOP participation to retain employees is low. In contrast, when the perceived ease of movement is high, employees are more likely to leave the firm, and the retaining effect of ESOP participation should be more effective. We follow prior literature that links the perceived ease of movement to general job availability as well as individual attributes, and test the moderating effects of (1) labor market conditions and (2) UA (Allen et al., 2005; Trevor, 2001).

First, we know that employees' perceived ease of movement and

[7] The literature on PO provides many similar statements that highlight the importance of stock ownership to "facilitate and speed up the emergence of psychological ownership" (Pierce et al., 2003, p. 96). For the focal firm, statements from a survey among the ESOP participants in 2018 confirm an emerging feeling of PO: "[The ESOP] means a lot for me and my family. My wife, my sons and I, want to let you know that we feel [name of firm] as ours and will do our best to get our company to the top" and "I would like to keep [the stock] for a very, very long time, to be part of my life."

[8] There are even associations of shareholders that consist of employee shareholders from the firm. These associations of shareholders show an active involvement as representatives of the employees at the firm's annual general meetings (AGMs) by not only attending, but especially in the form of proposals, countermotions, and similar actions. These associations of employee shareholders reflect several characteristics of PO. For example, both associations promote a sense of togetherness. One is being named "We for (name of the firm)," while the other describes the ownership in the firm as an identity-creating measure for employees. Further, the latter association filed a countermotion to not raise the dividend as planned in one recent year, which also speaks against the notion that the employee shareholders are purely financially motivated.

[9] In additional tests in Section 6, we provide evidence that even very small ESOP investments reduce the likelihood of a firm exit, thus suggesting that PO instead of economic reasons is behind the retention effect. Further, we provide evidence that for rank-and-file employees, the retention effect of ESOP participation is at least equally important as for senior managers, despite the enormous differences in the annual ESOP investment amounts (on average: €1,172 for rank-and-file employees and €16,422 for senior managers). Thus, we are confident in our assumption that, for senior managers, the economic aspects of ESOP participation are likely to be more pronounced in driving their firm exit decisions, while for rank-and-file employees, the effect arising from PO is likely to be more pronounced in their firm exit decisions.

[10] First, leaving the firm implies forgoing the sense of PO and the associated benefits (e.g., part of one's self-identity, sense of belongingness, and having a place). Second, rank-and-file employees' perceived responsibility and accountability should lead to stronger consideration of the consequences of a firm exit (e.g., feelings of letting their colleagues and employing firm down). Given the rareness of employee ownership and it being a strong trigger for PO, we expect these aspects to represent decisive benefits and costs for employees in their firm exit decisions.

thus their firm exit decisions are contingent on their appraisal of potential labor market opportunities (Gerhart, 1990; Oyer, 2004; Trevor, 2001). Negative labor market conditions coincide with less outside employment opportunities and make quitting less likely, as it might jeopardize financial security (Allen, Renn, Moffitt, & Vardaman, 2007). In contrast, favorable labor market conditions are associated with more outside opportunities, thus increasing the ease of movement (Munasinghe, 2006). While the likelihood of a firm exit increases, the potential loss of the PO benefits counteracts this exit likelihood (i.e., a cost–benefit trade-off). It is in this context that we expect the psychological benefits in the form of a sense of belongingness in the firm, identification with the employer, or the feeling of having a home in the current firm to be more effective in retaining employees. Thus, employees' considerations of the psychological benefits emerging from ESOP participation should gain in importance when labor market conditions are favorable and have a greater impact on the decision as to whether to leave the firm. Based on the arguments above, we propose:

H2a. *The retention effect of ESOP participation is greater when labor market conditions are favorable.*

Second, we argue that the relationship between ESOP participation and employees' firm exit decisions is contingent on their UA. UA describes the extent to which people feel threatened by uncertainty and attempt to avoid ambiguous situations (Hofstede, 1980).[11] Uncertainty-averse individuals prefer predictable events, while individuals ranking low in UA are more likely to accept and tolerate uncertainty (Hofstede, 2001). The concept of UA is closely linked to employees' perceived ease of movement, as leaving the firm entails unpredictable outcomes arising from the job search and a new environment. Hence, employees ranking low in UA are more likely to consider a firm exit, as they perceive the unpredictability of outside opportunities as less detrimental (e.g., higher ease of movement). It is in these situations of higher ease of movement that we expect the psychological benefits from PO to weigh stronger in counteracting employees' turnover intentions. On the other hand, for employees ranking high in UA, who have fewer intentions to leave, the retention effect of PO is less important. Consequently, we assume ESOP participation to unfold a higher effectiveness in retaining employees through PO for employees ranking low in UA. Accordingly, the effect of ESOP participation on firm exit decisions should be stronger for employees ranking low in UA. This leads to the following hypothesis:

H2b. *The retention effect of ESOP participation is greater when uncertainty avoidance (UA) is low.*

3. Research design

3.1. Data and sample

To estimate the effect of ESOP participation on the individual decisions of rank-and-file employees to leave their firms in a cross-country setting, we focus our analysis on a large firm based in Europe with subsidiaries worldwide. The firm operates in a variety of industries, such as healthcare, mobility management, and energy solutions (i.e., the firm has huge internal heterogeneity; see Appendix B for a detailed explanation of the firm's structure and how we accounted for it in our regressions). We were able to get access to internal data from 2011 to 2015 on individual employees' ESOP participation, turnover, and demographic information.[12]

The firm offers a broad-based ESOP on a yearly basis, where employees can decide to invest up to 5% of their income. To enable employees with very low incomes to access the ESOP, the program offers them the possibility of acquiring fractional shares, and thus of investing very small amounts. Moreover, depending on the country, the focal firm has either set very low minimum thresholds for ESOP investment amounts (e.g., €10 monthly) or none at all. The investment amount is deducted from the employee's salary each month, and physical shares are then added to the employee's securities account. Thus, participating rank-and-file employees get to exercise control (e.g., participation in annual meetings, voting rights).

The ESOP represents an economically attractive investment, as participants receive dividends during the holding period and one matching share for every three purchased shares after a three-year vesting period (or a fractional share at a ratio of 1:3 if employees possess less than three shares). If employees leave the firm before the shares vest, they keep the purchased shares, benefit from dividends as well as a potential positive share price development, and only forfeit the matching shares. Over previous years, the share price has shown solid development. Even though employees from all hierarchy levels are eligible to participate in the program, we find that a great proportion of the rank-and-file employees do not participate in the ESOP.[13] Since its introduction in the late 2000s, the features of the ESOP and its communications have been homogeneous across countries. Similar to the study by Hofstede (1980), our research design holds firm effects constant, which enables us to better isolate the effects of country-level factors on the relationship between ESOP participation and firm exits.

Our initial dataset comprised observations for all employees outside the firm's home country from the firm's internal HR database. In order to analyze individual rank-and-file employees' decisions to leave the firm, we excluded the following from our observations: (1) senior managers, (2) short-term employees, (3) employees entering retirement, (4) employees from divested organizational units,[14] (5) countries where only senior managers were eligible and all countries where no ESOP participant had left the firm, (6) employees who had only been in the firm's database for one year or who had only been eligible for one year,[15] and (7) all observations with missing data for the control or country-level variables.

The resulting sample comprises 654,706 observations for 190,370 individual employees in 39 countries over the period from 2011 to 2015. Table 1 summarizes the sample selection, and Table 2

[11] In the questionnaire used for Hofstede's cultural values framework, one of the three questions for the UA dimension particularly addresses employment stability by asking, "How long do you think you will continue working for this company?" (Hofstede, 1980, p. 162). Moreover, vis-à-vis Hofstede's other cultural dimensions, we consider UA to fit particularly well with the concept of employees' perceived ease of movement and thus their firm exit decisions due to the inherent unpredictability of a job change. For example, employees ranking high in UA are likely to experience a low perceived ease of movement, while employees ranking low in UA are likely to experience a high perceived ease of movement. In additional tests, we control for Hofstede's other cultural dimensions and find that our results hold.

[12] Some of the data have been used in other cross-country studies (Ahrens, Oehmichen, & Wolff, 2018; Oehmichen, Wolff, & Zschoche, 2018). However, previous studies only used cross-sectional data from 2012 and did not have access to a panel data set.

[13] From an economic perspective, this finding is startling yet confirmed by a large body of literature examining this issue (e.g., Babenko & Sen, 2014; Bova, Kolev, Thomas, & Zhang, 2015; Duflo & Saez, 2002; Oehmichen et al., 2018).

[14] We relied on an approximation by identifying organizational units where more than or equal to 70% of employees had left, suggesting that these organizational units were subject to divestitures. We validated the results by collating our identified divestiture units with publicly available data for major divestments and found confirmation for the approach. Moreover, we reran our analyses with the exclusion of organizational units where 80% and 90% of the employees had left. The results remained unchanged.

[15] We did so to reduce potential database errors.

Table 1
Sample selection.

	Observations
Observations for all eligible employees for the years 2011–2015 outside the firm's home country	908,031
Remove observations of senior managers	−30,897
Remove observations of employees with a temporary contract	−100,587
Remove observations of employees who retire	−3,410
Remove observations of employees who belong to divested organizational units	−36,108
Remove observations of employees in countries where only senior managers are eligible	−536
Remove observations of employees in countries where no ESOP participant leaves the firm	−3,360
Remove observations of employees who have only been one year in the firm's database	−42,420
Remove observations of employees who have only been ESOP eligible for one year	−846
Remove observations with missing data for control or country-level variables	−35,161
Final Sample	**654,706**

presents an overview of the absolute and relative number of employees, ESOP participants, and firm exits per country. Emerging from this overview, we began our exploration of the relationship between ESOP participation and firm exit with a scatterplot. Fig. 1 presents a plot of the country-average values of ESOP participation and firm exit rates. The relationship is strongly negative, suggesting that in countries with higher ESOP participation relatively fewer employees leave the firm and thus provides a first indication.

3.2. Empirical models and variables

To test our hypotheses, we follow prior literature (Angrist & Pischke, 2009; Aobdia & Cheng, 2018; Guo & Masulis, 2015) and estimate a linear probability model (LPM) using OLS regressions, where we cluster standard errors by employees.[16] As ESOP participation represents an endogenous choice of employees, omitted factors could drive this relationship. Therefore, we complement OLS regressions with 2SLS regressions in the main analysis and supplemental tests where applicable (e.g., Fu, Kraft, & Zhang, 2012; Liu, 2020).[17] After describing the hypotheses testing using OLS in the following section, we then discuss the implementation of 2SLS for the hypotheses testing.

3.2.1. OLS regressions

To test Hypothesis 1 regarding the relationship between ESOP participation and the firm exit decisions of rank-and-file employees, we estimate the following regression:

$$Firm\ Exit_{i,t+1} = \alpha + \beta(ESOP\ Participation)_{i,t} + \gamma(Controls)_{i,t} + Year_t + Business\ Unit_i + Region_i + \varepsilon_{i,t} \quad (1)$$

where *Firm Exit* is our dependent variable that measures whether an employee left the firm in year t + 1. The variable is coded as 1 if the employee left the firm in the year following his/her decision and 0 otherwise. Our independent variable *ESOP Participation* takes a value of 1 if the employee participated in the offered ESOP in year t and 0 otherwise. We intentionally created this one-year lag to separate the point in time when the employee had decided whether to participate in the ESOP from the decision regarding whether to leave the firm.

We include several control variables that might influence firm exit decisions of rank-and-file employees. On the individual level, we consider the following variables: *Gender* is a dummy variable that takes a value of 1 for males and 0 for females. We measure *Age* in years and *Tenure* as the natural logarithm of years. *Education* takes the value of 1 if the employee has a master's degree and 0 otherwise. We include *Total Cash* as a proxy for employees' income.[18] We code *Hierarchy Level* as 1 if the employee belongs to the upper hierarchy levels among the rank-and-file employees and 0 otherwise. Further, we add indicator variables that cluster the job families within the areas of *Administration*, *Production*, *R&D,* and *Sales*, while we omit the area of *Procurement*. On the organizational level, we consider *Group Behavior* as the proportion of employee firm exits within each organizational unit. We also include *Organizational Unit Size* measured as the logarithm of the number of employees in each organizational unit. Finally, we control for year, business unit, and region fixed effects[19] throughout. Our results are robust to different ways of clustering the standard errors, such as at the country level, business-unit level, or organizational-unit level, and using organizational unit and country fixed effects.

To investigate our second set of hypotheses, we include an interaction term of *ESOP Participation* and *Labor Market Conditions* for Hypothesis 2a, and, for Hypothesis 2b, an interaction term of *ESOP Participation* and *Uncertainty Avoidance*. We add the respective moderator (*M*) of *Labor Market Conditions* and *Uncertainty Avoidance:*[20]

$$Firm\ Exit_{i,t+1} = \alpha + \beta(ESOP\ Participation)_{i,t} + \beta_2(ESOP\ Participation\ x\ M)_{i,t} + \gamma_1(M)_{i,t} + \gamma_2(Controls)_{i,t} + Year_t + Business\ Unit_i + Region_i + \varepsilon_{i,t} \quad (2)$$

where *Labor Market Conditions* is the unemployment rate from the World Bank, which we reverse to facilitate the interpretation of outside opportunities and favorable labor market conditions (e.g., Kale, Ryan, & Wang, 2019). For our *Uncertainty Avoidance* measure, we employ Hofstede's cultural values framework (Hofstede, 1980). "Validated by its cumulative impact on business research" (Karolyi, 2016, p. 216), we rely on the UA index to differentiate between

[16] We chose an LPM over a nonlinear logit or probit model for two reasons. First, an LPM facilitates the interpretation of the interaction terms that we include to test Hypotheses 2a and 2b (Norton, Wang, & Ai, 2004). Second, given our inclusion of a large number of fixed effects, an LPM helps to avoid the incidental parameters problem (Wooldridge, 2002).

[17] In their paper on the use of 2SLS, Larcker and Rusticus (2010) also recommend comparing OLS and 2SLS regressions results.

[18] As we were not able to get individual income data for all employees, we assumed that employees' income per sub-job family and country was comparable and calculated the respective average income. The sub-job family is a more precise description of an employee's function, while the job family describes a broader functional area that includes various sub-job families. For example, the job family "sales" includes the sub-job family "key account management," while "R&D" includes "software development." See Appendix B for a more detailed explanation of the firm's structure.

[19] Given the distribution of countries in our sample, we use the following global regions: Africa, North America, South America, Mesoamerica, East Asia, West and Central Asia, Europe, and Oceania.

[20] We mean-centered the variables in the interaction terms to reduce issues of multicollinearity (Aiken & West, 1991).

Table 2
Overview of the number (percentage) of employee-years, ESOP participation employee-years, and firm exit employee-years per country for the years 2011–2015.

Country	No. of employee-years	No. (Perc.) of ESOP participations	No. (Perc.) of firm exits
Australia	7,821	1,036 (13.25%)	535 (6.84%)
Austria	10,692	3,882 (36.31%)	412 (3.85%)
Belgium	7,917	713 (9.01%)	356 (4.50%)
Brazil	30,502	731 (2.40%)	3,635 (11.92%)
Canada	17,517	1,887 (10.77%)	1,084 (6.19%)
Chile	562	62 (11.03%)	32 (5.69%)
China	41,575	4,315 (10.38%)	3,012 (7.24%)
Czech Republic	38,762	1,876 (4.84%)	2,005 (5.17%)
Denmark	16,513	3,750 (22.71%)	853 (5.17%)
Egypt	1,254	47 (3.75%)	87 (6.94%)
Finland	1,215	369 (30.37%)	67 (5.51%)
France	32,068	2,170 (6.77%)	1,474 (4.60%)
Hong Kong	2,052	219 (10.67%)	108 (5.26%)
Hungary	7,038	209 (2.97%)	424 (6.02%)
India	28,859	765 (2.65%)	2,207 (7.65%)
Indonesia	7,134	37 (0.52%)	765 (10.72%)
Ireland	1,355	51 (3.76%)	52 (3.84%)
Israel	2,040	218 (10.69%)	181 (8.87%)
Italy	11,030	153 (1.39%)	323 (2.93%)
Malaysia	7,042	717 (10.18%)	214 (3.04%)
Mexico	27,037	444 (1.64%)	2,505 (9.27%)
Netherlands	11,742	1,091 (9.29%)	366 (3.12%)
New Zealand	414	92 (22.22%)	39 (9.42%)
Norway	3,223	542 (16.82%)	159 (4.93%)
Philippines	1,391	171 (12.29%)	46 (3.31%)
Poland	3,407	378 (11.09%)	131 (3.85%)
Romania	4,231	121 (2.86%)	189 (4.47%)
Singapore	6,823	964 (14.13%)	593 (8.69%)
Slovakia	6,554	396 (6.04%)	279 (4.26%)
South Africa	2,513	130 (5.17%)	165 (6.57%)
South Korea	7,382	1,132 (15.33%)	236 (3.20%)
Spain	7,212	1,583 (21.95%)	202 (2.80%)
Sweden	4,515	1,622 (35.92%)	198 (4.39%)
Switzerland	21,443	3,717 (17.33%)	1,078 (5.03%)
Taiwan	2,495	651 (26.09%)	125 (5.01%)
Thailand	5,106	162 (3.17%)	410 (8.03%)
Turkey	11,981	947 (7.90%)	668 (5.58%)
United Kingdom	26,804	4,979 (18.58%)	1,530 (5.71%)
United States	227,485	32,932 (14.48%)	14,316 (6.29%)
Total	654,706	75,261 (11.50%)	41,061 (6.27%)

Notes: This table reports the number (percentage) of employee-year observations, the number (percentage) of ESOP participation employee-year observations, and the number (percentage) of firm exit employee-year observations per country for the years 2011–2015.

employees (and their beliefs) across cultures (e.g., Brochet, Miller, Naranjo, & Yu, 2019; Debus, Probst, König, & Kleinmann, 2012; Kwok & Tadesse, 2006). As we conduct our study within one firm, there are no firm effects that confound the effects on the country level. Appendix A outlines definitions and data sources for all variables. Appendix B explains the focal firm's structure. Appendix C provides the values for our moderator variables.

3.2.2. 2SLS regressions

The instrumental variable (IV) approach is an effective and commonly used method in accounting research to tackle endogeneity concerns, such as an omitted variable bias (Larcker & Rusticus, 2010). In our case, ESOP participation is a choice variable and not likely to be random. Thus, we face the potential of an omitted factor driving both an employee's ESOP participation and firm exit decision. More precisely, in our study we argue that an employee's ESOP participation leads to PO, which then results in a reduced likelihood of firm exit. However, there is the possibility of pre-existing PO (a factor we cannot capture) that affects the employee's ESOP participation and firm exit decision at the same time. If this were the case, the omitted factor (i.e., pre-existing PO) would strengthen the positive relationship between ESOP participation and firm exit. In general, IVs must satisfy two conditions to be valid. First, the relevance condition requires that instruments are correlated with the endogenous variable. Second, the exclusion condition requires that instruments should only indirectly relate to the outcome variable through its effect on the endogenous variable. Thus, it is important to select an IV that relates to ESOP participation, but must not be a determinant of firm exit. Moreover, in line with our arguments of the construct of PO, the IV should also not be related to pre-existing PO. The success of 2SLS depends on the quality of the IV to fulfill these conditions. Larcker and Rusticus (2010) particularly point to the issue of weak instruments as they are more likely to cause wrong statistical inference than standard OLS estimates that make no correction for endogeneity.

We select financial literacy as the instrument for ESOP participation. The rationale behind this instrument is that individuals with higher financial literacy face lower barriers when dealing with stock markets. However, it is a widespread issue that people lack basic economic knowledge (Hilgert, Hogarth, & Beverly, 2003; Lusardi & Mitchell, 2007). In this vein, studies point out “that stocks are complex assets, and many households may not know or understand stocks and the workings of the stock market.” (van Rooij, Lusardi, & Alessie, 2011, p. 460) We expect financial literacy to enable employees to better understand the investment in ESOPs and to recognize its benefits. Empirically financial literacy has also been linked to investment decisions as those with high literacy are more likely to invest in stocks (van Rooij et al., 2011) and ESOPs in

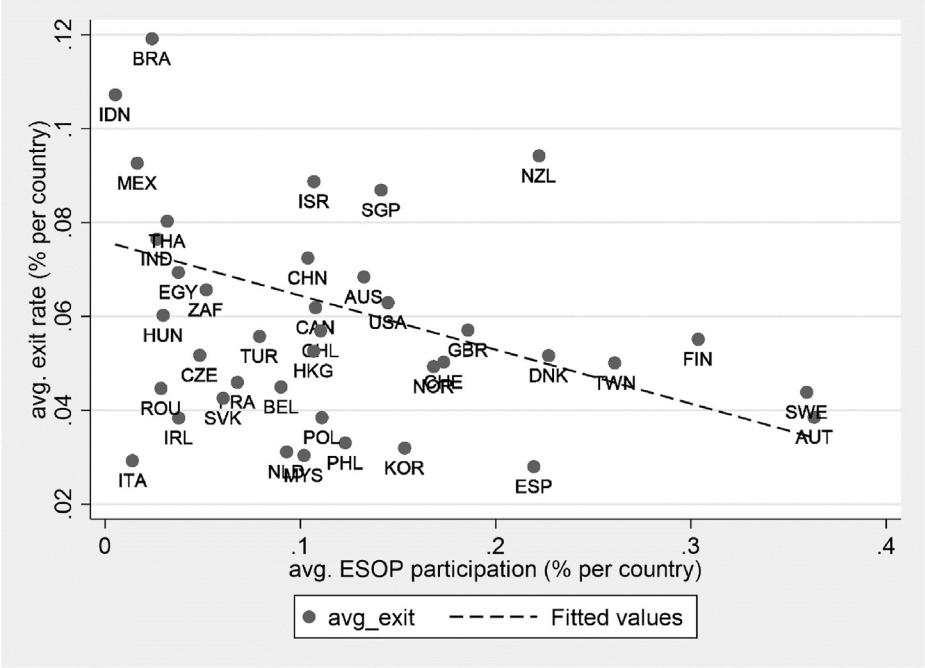

Fig. 1. Scatterplot of average country-level ESOP participation and firm exit rates.

particular (Babenko & Sen, 2014). Thus, financial literacy satisfies the relevance condition. At the same time, it is difficult to imagine how financial literacy should relate to pre-existing PO or firm exit decisions and therefore likely satisfies the exclusion condition.[21] While our data for ESOP participation varies at the employee level, there was no individual-level data for financial literacy available, especially, on a global scale. Instead, we obtained financial literacy data aggregated at the country level from the Standard & Poor's Ratings Services Global Financial Literacy Survey (S&P Global FinLit Survey). The survey is based on over 150,000 interviews with representative adults in more than 140 countries. We follow Klapper, Lusardi, and van Oudheusden (2014) and Meoli, Rossi, and Vismara (2021) in measuring financial literacy as the percentage of adults who are financially literate in one country and then apply this value to the employees in the country.[22]

In the first-stage regression, the dependent variable is *ESOP Participation* and the independent variables include *Financial Literacy* as the IV as well as the control variables discussed in the OLS. In the second-stage regressions, the fitted values of *ESOP Participation* are used as the independent variable. The other variables remain the same as in the OLS.

4. Empirical results

4.1. Summary statistics

Table 3 reports the descriptive statistics and the correlation matrix for our final sample of 654,706 employee-year observations. The individual employee turnover variable *Firm Exit* has a mean of 0.06 and is similar to the data from Aldatmaz et al. (2018). Providing an indication consistent with our expectation, the matrix shows a negative correlation between ESOP participation and firm exit decisions.

4.2. First-stage regression results

Table 4 presents the first-stage regression results of the 2SLS, in which we estimate employees' *ESOP Participation* using our IV (*Financial Literacy*) and control variables. We observe that, consistent with theory and prior research, *Financial Literacy* loads positively and significant ($\beta = 0.003$, $p < 0.01$). Following Larcker and Rusticus (2010), we further evaluate the strength of our instrument with a partial *F*-statistic to assess its incremental explanatory power over the control variables. The partial *F*-statistic greatly exceeds the Stock and Yogo (2005) critical value of 16.38 based on a 10% Stock-Yogo maximum IV size and thus rejects the null that the instrument is weak. Moreover, we find that an employee's participation is positively (negatively) related to *Gender*, *Age*, *Tenure*, *Education*, *Total Cash*, *Hierarchy Level*, *Administration*, *R&D*, and *Sales* (*Production*, *Group Behavior*, and *Organizational Unit Size*).

4.3. OLS and 2SLS (second-stage) regression results

Table 5 presents the regression results of the multivariate analysis with Panel A reporting the OLS and Panel B the 2SLS regressions. In both panels, Model 1 shows the results for Hypothesis

[21] To address concerns of reverse causality, financial literacy is supposed to be only related to ESOP participation, but not directly to PO or firm exit. As PO could also stem from controlling or knowing the target, we have to rule out that financial literacy relates to these two sources of PO. First, financial literacy should have no direct effect on controlling the target (i.e., power). Even if employees in the finance department would rank systematically higher and thus possess more power, we would capture this through the set of control variables. Second, financial literacy is a proxy for general knowledge and not firm-specific knowledge, which makes knowing the target not more likely. Moreover, we cannot think of a conceptual expectation regarding an obvious relation between financial literacy and firm exit.

[22] Given that financial literacy varies at the country-level, it may relate to other country-level determinants of ESOP. Indeed, our data show some high correlations between financial literacy and country-level factors, such as culture, legislation, or the economic situation. In sensitivity tests, we therefore include potential country-level determinants of ESOP in both the first- and second-stage regressions. The results show that after controlling for a bunch of country-level factors the relation between financial literacy and ESOP participation in the first-stage remains positive as well as highly significant and the results of the second-stage regressions also remain quantitatively and qualitatively similar.

Table 3
Summary statistics.

No.	Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Firm Exit	0.063	0.242		−0.053	−0.025	0.036	−0.005	−0.023	−0.036	−0.050	−0.004	−0.021	−0.014	0.011	0.006	−0.007	−0.012	0.386	0.042
2	ESOP Participation	0.115	0.319	−0.053		0.107	0.017	−0.083	0.045	0.089	0.066	0.090	0.184	0.132	0.037	−0.121	0.049	0.038	−0.073	−0.122
3	Financial Literacy	50.128	13.814	−0.031	0.123		−0.099	−0.214	0.027	0.280	0.102	−0.019	0.487	0.042	0.035	−0.011	−0.020	0.003	−0.024	−0.103
4	Labor Market Conditions	20.250	3.078	0.030	0.013	−0.079		−0.335	−0.031	−0.103	−0.063	0.008	−0.116	0.013	−0.031	0.004	0.052	−0.033	0.095	0.071
5	Uncertainty Avoidance	54.658	19.271	−0.005	−0.089	−0.229	−0.347		0.018	−0.040	0.041	0.015	−0.216	−0.049	−0.011	0.099	−0.108	0.006	0.039	0.055
6	Gender	0.740	0.439	−0.023	0.045	0.045	−0.018	0.011		0.050	0.037	0.020	0.056	0.056	−0.251	0.012	0.148	0.120	−0.010	0.064
7	Age	42.773	10.629	−0.032	0.083	0.332	−0.057	−0.083	0.050	0.576	0.581	−0.020	0.317	0.183	0.008	−0.012	−0.069	0.073	−0.066	−0.100
8	Tenure	2.219	0.774	−0.042	0.065	0.156	−0.073	0.020	0.039	0.576		−0.030	0.159	0.172	0.002	−0.002	−0.041	0.043	−0.099	−0.070
9	Education	0.134	0.341	−0.004	0.090	0.012	0.020	0.023	0.020	−0.018	−0.031		0.094	0.153	0.065	−0.174	0.158	−0.045	−0.039	−0.128
10	Total Cash	0.561	0.358	−0.015	0.178	0.544	−0.016	−0.289	0.050	0.299	0.146	0.103		0.243	0.132	−0.413	0.108	0.179	−0.107	−0.330
11	Hierarchy Level	0.096	0.295	−0.014	0.132	0.058	0.007	−0.063	0.056	0.177	0.167	0.153	0.269		0.127	−0.148	0.002	0.019	−0.072	−0.223
12	Administration	0.237	0.425	0.011	0.037	0.034	−0.039	−0.019	−0.251	0.007	0.000	0.065	0.148	0.127		−0.285	−0.306	−0.346	−0.045	−0.273
13	Production	0.208	0.406	0.006	−0.121	−0.048	0.026	0.114	0.012	−0.014	0.002	−0.173	−0.384	−0.148	−0.285		−0.281	−0.318	0.103	0.427
14	R&D	0.232	0.422	−0.007	0.049	−0.022	0.051	−0.101	0.148	−0.063	−0.041	0.158	0.086	0.002	−0.306	−0.281		−0.341	−0.013	−0.016
15	Sales	0.278	0.448	−0.012	0.038	0.042	−0.037	−0.007	0.120	0.070	0.041	−0.045	0.161	0.019	−0.346	−0.318	−0.341		−0.040	−0.087
16	Group Behavior	0.064	0.123	0.479	−0.045	−0.037	0.051	0.019	−0.034	−0.048	−0.082	−0.013	−0.023	−0.018	0.020	0.009	−0.011	−0.023		0.303
17	Organizational Unit Size	3.483	1.213	0.052	−0.127	−0.158	0.089	0.088	0.027	−0.116	−0.075	−0.130	−0.331	−0.217	−0.260	0.470	−0.039	−0.116	0.106	

Notes: This table presents descriptive statistics and the correlation matrix for the regression variables of our sample of 654,706 employee-year observations. The Pearson (Spearman) correlations are below (above) the diagonal. All correlations greater than or equal to 0.004 are significant at the 1 percent level.

1, testing whether ESOP participation is negatively related to an employee's exit. Consistent with our hypothesis, we find negative and significant coefficients for *ESOP Participation* in the OLS ($\beta = -0.024$, $p < 0.01$) and the 2SLS ($\beta = -0.103$, $p < 0.01$). For the assessment of the economic effects, we focus on the results of the OLS as employees can only choose to participate (1) or not to participate (0) in the ESOP. Therefore, the binary variable of *ESOP Participation* in the OLS facilitates a more straight-forward interpretation that better reflects reality, whereas *ESOP Participation* in the 2SLS is the expected value in form of a continuous variable. Nonetheless, when we compare the economic effects of the two models in terms of increases of one standard deviation from the mean in *ESOP Participation*, we find almost identical effect sizes.[23] Based on the results from OLS, we find rank-and-file employees who participate in the ESOP to be 2.41 percentage points less likely to leave the firm within the next year. While the average likelihood of a firm exit is 6.27%, it is 6.55% for non-participants and 4.14% for participants. To put this result into perspective, a survey study by Bryson and Freeman (2019) found a gap of 6 percentage points in the intention to leave between non-participants (8%) and participants (2%) of a firm's employee ownership plan. Given that these survey results might be subject to the common rater bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), the more moderate economic magnitude of our results seems plausible.

In both panels, Model 2 tests Hypothesis 2a, which proposes that the effect of ESOP participation on firm exit is stronger under favorable labor market conditions. We continue to find negative and significant coefficients for *ESOP Participation*. We also find negative and significant coefficients for the interaction term between *ESOP Participation* and *Labor Market Conditions* in the OLS ($\beta = -0.002$, $p < 0.01$) and the 2SLS ($\beta = -0.018$, $p < 0.01$), which support our hypothesis. The OLS results suggest that an increase of one standard deviation in *Labor Market Conditions* augments the retention effect of *ESOP Participation* to 2.99 percentage points. To put it differently, when labor market conditions are favorable (mean + 1SD), the likelihood of a firm exit is 6.89% for non-participants and 3.90% for participants. Further, we find that the coefficient for *Labor Market Conditions* is positive and significant, consistent with employees being more likely to leave when encountering favorable outside employment opportunities.

In both panels' Model 3, we test Hypothesis 2b, which posits a stronger retention effect from ESOP participation in cultures with lower levels of UA. Again, we find that the coefficients for *ESOP Participation* are negative and significant. In line with our hypothesis, the results document positive and significant coefficients for the interaction term between *ESOP Participation* and *Uncertainty Avoidance* in both the OLS ($\beta = 0.0002$, $p < 0.01$) and the 2SLS ($\beta = 0.003$, $p < 0.01$). The OLS results indicate that a decrease of one

[23] To compare the effects sizes resulting from the OLS and 2SLS, we assess increases in *ESOP Participation* of one standard deviations from the mean. For the OLS, an increase in *ESOP Participation* results in a shift of firm exit likelihood from 6.27% at the mean to 5.50% at the mean plus on standard deviation. For the 2SLS, an increase in *ESOP Participation* results in a shift of firm exit likelihood from 6.27% at the mean to 5.54% at the mean plus on standard deviation. Thus, the difference in firm exit likelihood between the OLS and 2SLS results for increased ESOP participation is smaller than one percent. We note that the results for the following hypotheses vary more strongly between the regression models. The results obtained from the 2SLS consistently translate into larger effect sizes than the ones obtained from the OLS and discussed in the text. Thus, we are confident that the effect sizes discussed in the text rather represent conservative estimates. In particular, we find that an increase (mean + 1 SD) in *ESOP Participation* in favorable labor market conditions (mean + 1 SD) decreases the firm exit likelihood by 15% in the OLS and by 20% in the 2SLS. We further find that an increase (mean + 1 SD) in *ESOP Participation* for rank-and-file employees ranking low in UA (mean − 1SD) decreases the firm exit likelihood by 13% in the OLS and by 21% in the 2SLS.

Table 4
First-stage regressions results.

VARIABLES	(1)
	ESOP Participation
Financial Literacy	0.003***
	(19.035)
Gender	0.020***
	(13.459)
Age	0.000***
	(3.779)
Tenure	0.007***
	(7.178)
Education	0.048***
	(19.536)
Total Cash	0.081***
	(23.639)
Hierarchy Level	0.072***
	(23.246)
Administration	0.014***
	(4.600)
Production	−0.008***
	(-3.035)
R&D	0.032***
	(10.384)
Sales	0.021***
	(7.298)
Group Behavior	−0.071***
	(-19.059)
Organizational Unit Size	−0.006***
	(-10.159)
Intercept	−0.169***
	(-13.120)
Year fixed effects	Yes
Business unit fixed effects	Yes
Region fixed effects	Yes
N	654,706
Adjusted R^2	0.10
Partial *F*-statistic	1510.93***

Notes: This table reports the first-stage regression of the 2SLS regression analysis using financial literacy as the instrument variable. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. Robust standard errors are clustered at the employee level and *t*-statistics are provided in parentheses. Appendix A provides definitions and data sources for the regression variables.

standard deviation in *Uncertainty Avoidance* increases the retention effect of *ESOP Participation* to 2.69 percentage points. More specifically, among rank-and-file employees ranking low in UA (mean − 1SD), the likelihood of a firm exit is 6.77% for non-participants and 4.08% for participants. The coefficients for *Uncertainty Avoidance* are negative and significant, as leaving the firm involves uncertainty.

Following Larcker and Rusticus (2010), we next assess the severity of the endogeneity problem. First, we perform the Hausman test to evaluate the difference between the OLS and 2SLS results. We find that the 2SLS results are significantly different from the OLS results ($p < 0.01$) thus suggesting the existence of endogeneity. Second, given the confirmation of the existence of endogeneity in our study, we use an alternative approach to assess how large the endogeneity problem has to be to overturn our OLS results. In line with Larcker and Rusticus (2010), we use the approach by Frank (2000) to calculate how strongly an omitted variable would have to be correlated with both the independent and dependent variable to make the coefficient statistically insignificant. Specifically, we calculate the impact threshold for a confounding variable (ITCV). The ITCV is −0.0412, implying that the omitted variable would have to be correlated at 0.203 with *Firm Exit* and −0.203 with *ESOP Participation* (signs are interchangeably) to overturn our results. We follow Larcker and Rusticus (2010) and compare the ITCV with the impact of our controls. The ITCV is 2.77 times higher than the impact of *Group Behavior* (i.e., the control variable with by far the highest impact). Given the assumption that we have selected a reasonable set of control variables this indicates that it is rather unlikely that an omitted variable has confounded our OLS results. Paired with the results from the 2SLS, this provides some confidence in the inferences drawn from the regressions.

5. Sensitivity tests

5.1. Propensity score matching (PSM) procedure

ESOP participation is an endogenous choice, and thus unobserved factors could drive the employees' decision to participate in the ESOP and the decision to leave the firm. The PSM procedure accounts for differences in observable characteristics between ESOP participants as well as non-participants and thus mitigates concerns about unobservable characteristics that may be linked to these observable characteristics (Chang, Chung, & Moon, 2013; Chen, Luo, Tang, & Tong, 2015). The PSM matches each treatment observation (i.e., participant) with a control observation (i.e., non-participant) that has similar observable characteristics. We follow the procedure suggested by Shipman, Swanquist, and Whited (2017), and regress *ESOP Participation* on our previously used control variables to estimate the probability (i.e., the propensity score) that an employee will participate in the ESOP. Based on the propensity score, we perform a "one-to-one" matching without replacement and set the caliper to be within ±0.001% to make the matched employees as similar as possible. Our matched sample consists of 146,204 employee years.

We assess the matching quality using both univariate and multivariate tests (see Internet Appendix,Table IA1). The tests reveal that the post-match regression explains almost none of the observed variance and that no differences in the propensity score remain in the matched sample. Moreover, for the individual control variables, we observe some statistically significant differences between the two samples, which, however, are much smaller in the matched sample than in the unmatched sample. Based on the matched sample, we reexamine our hypotheses. Table 6 reports the results, which substantiate our previous findings.

5.2. Subsample analyses excluding employees with specific knowledge about the ESOP

To control for the impact of different degrees of familiarity with the ESOP, we rerun our tests excluding specific employee groups. First, we exclude employees from the Finance and HR Departments, as they are deeply involved in the firm's communication to foster participation. Second, we exclude employees who hold a master's degree, as employees with higher levels of education might have better access to stock-related information. Third, we exclude employees who have been with the firm for a long time (i.e., above the median tenure), as these employees should be very familiar with the firm, including the ESOP. Our results (see Internet Appendix, Tables IA3-IA.5) show that for all three modifications in the OLS as well as the 2SLS regressions, the results hold.

5.3. Alternative country-level variables

In this section, we evaluate our results' robustness regarding the country-level context. In our main tests, we controlled for the countries' affiliation to specific regions. This enabled us to account for regional economic factors and cultural covariates without specifying individual country-level variables. In order to

Table 5
Hypotheses testing.

Panel A: OLS regressions			
VARIABLES	(1)	(2)	(3)
	Firm Exit	Firm Exit	Firm Exit
ESOP Participation	−0.024***	−0.024***	−0.023***
	(-34.939)	(-34.784)	(-33.202)
ESOP Participation * Labor Market Conditions		−0.002***	
		(-10.004)	
Labor Market Conditions		0.001***	
		(5.932)	
ESOP Participation * Uncertainty Avoidance			0.000***
			(5.049)
Uncertainty Avoidance			−0.000***
			(-3.866)
Gender	−0.001	−0.001	−0.001
	(-1.035)	(-1.008)	(-1.133)
Age	−0.000	−0.000	−0.000
	(-2.243)	(-2.322)	(-2.357)
Tenure	−0.003***	−0.002***	−0.002***
	(-6.174)	(-6.000)	(-6.094)
Education	0.003***	0.003***	0.003***
	(3.442)	(3.560)	(3.604)
Total Cash	0.005***	0.005***	0.005***
	(4.072)	(3.970)	(3.724)
Hierarchy Level	−0.003***	−0.003***	−0.003***
	(-3.676)	(-3.690)	(-3.610)
Administration	0.000	0.000	0.000
	(0.115)	(0.107)	(0.082)
Production	0.002	0.001	0.001
	(0.990)	(0.982)	(0.950)
R&D	0.001	0.001	0.001
	(0.967)	(0.904)	(0.866)
Sales	−0.001	−0.001	−0.001
	(-0.704)	(-0.735)	(-0.751)
Group Behavior	1.042***	1.042***	1.042***
	(222.580)	(222.484)	(222.575)
Organizational Unit Size	−0.001***	−0.001***	−0.001***
	(-3.831)	(-3.808)	(-3.507)
Intercept	0.008	0.025***	0.008
	(1.002)	(2.956)	(1.009)
Year fixed effects	Yes	Yes	Yes
Business unit fixed effects	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes
N	654,706	654,706	654,706
Adjusted R^2	0.24	0.24	0.24

Panel B: 2SLS regressions			
VARIABLES	(1)	(2)	(3)
	Firm Exit	Firm Exit	Firm Exit
ESOP Participation	−0.103***	−0.131***	−0.134***
	(-4.586)	(-5.542)	(-5.366)
ESOP Participation * Labor Market Conditions		−0.018***	
		(-10.882)	
Labor Market Conditions		0.001***	
		(6.274)	
ESOP Participation * Uncertainty Avoidance			0.003***
			(13.551)
Uncertainty Avoidance			−0.000***
			(-5.769)
Gender	0.001	0.001*	0.001
	(1.070)	(1.800)	(1.324)
Age	−0.000	−0.000	−0.000
	(-1.376)	(-1.076)	(-1.275)
Tenure	−0.002***	−0.002***	−0.002***
	(-4.566)	(-4.026)	(-4.189)
Education	0.006	0.008	0.008
	(4.882)	(5.949)	(5.473)
Total Cash	0.013***	0.015***	0.017***
	(5.215)	(6.178)	(6.806)
Hierarchy Level	0.002	0.004**	0.006***
	(1.296)	(2.335)	(2.939)
Administration	0.001	0.001	0.001

(*continued on next page*)

Table 5 (*continued*)

Panel B: 2SLS regressions			
VARIABLES	(1)	(2)	(3)
	Firm Exit	Firm Exit	Firm Exit
	(0.802)	(0.939)	(0.675)
Production	0.001	0.001	0.001
	(0.657)	(0.597)	(0.740)
R&D	0.004**	0.005***	0.004***
	(2.415)	(2.875)	(2.678)
Sales	0.001	0.001	0.001
	(0.399)	(0.682)	(0.474)
Group Behavior	1.037***	1.034***	1.034***
	(210.951)	(208.814)	(208.061)
Organizational Unit Size	−0.002***	−0.002***	−0.001***
	(-5.016)	(-5.619)	(-4.399)
Intercept	0.003	0.030***	−0.015*
	(0.342)	(3.258)	(-1.670)
Year fixed effects	Yes	Yes	Yes
Business unit fixed effects	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes
N	654,706	654,706	654,706
Adjusted R^2	0.24	0.24	0.24

Notes: This table reports regression analyses of the employees' ESOP participation (*ESOP Participation*) on the firm exit decision (*Firm Exit*) and the moderating effects of *Labor Market Conditions* and *Uncertainty Avoidance*. Panel A reports regressions using OLS. Panel B reports regressions using 2SLS. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. Robust standard errors are clustered at the employee level and *t*-statistics are provided in parentheses. Appendix A provides definitions and data sources for the regression variables.

demonstrate that our results are not driven by the choice of our research design (i.e., the omission of specific country-level variables), we repeat our main analyses with a set of county-level variables instead of region fixed effects. This is particularly important for 2SLS as the chosen IV *Financial Literacy* moves at the country-level and may therefore relate to other country-level determinants of ESOP participation.

In both, the OLS and the two stages of the 2SLS, we consider aspects from different areas that should be relevant in our context. First, we consider culture in form of the five Hofstede measures *Uncertainty Avoidance*, *Individualism*, *Power Distance*, *Masculinity*, and *Long-term Orientation*. Second, we address the legal institutions in a country by including the anti-self-dealing (*ASD*) index and a dummy variable for common law countries (*Common Law*) from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008). We also add a workers' rights index (*Workers' Rights*) as a statement regarding the general relationship between employers and employees. Third, we account for the populations' familiarity and experiences with shares in the form of the total value of stocks traded as a percentage of the GDP (*Stocks Traded*). Fourth, we include the GDP growth rate (*GDP Growth*) to reflect the economic development. Table 7 presents the results for the OLS in Panel A and for the second-stage-regressions of the IV approach in Panel B, which are consistent with our primary results.[24] The first-stage regressions results of the IV approach including the country-level determinants are reported in Table IA2 of the Internet Appendix. The results illustrate that despite high correlations between the country-level determinants, the effect of *Financial Literacy* on *ESOP Participation* remains highly significant ($p < 0.01$).

6. Additional tests: the role of psychological ownership

In this section, we provide empirical evidence to support our conceptual arguments for the relevance of PO for the retention effect of ESOP participation among rank-and-file employees. Our aim is twofold: (1) to substantiate ESOP participation as a driver of PO for rank-and-file employees, and (2) to contrast our arguments regarding the retention effect of PO arising from ESOP participation for rank-and-file employees with economic arguments that are likely to apply more strongly to higher-level managers.

6.1. PO arising from ESOP participation

The PO literature considers ESOP participation as a powerful driver for developing a sense of PO (Pierce et al., 1991). In our study, we build on the importance of this argument for rank-and-file employees. In the following, we perform tests to substantiate this relationship.

6.1.1. Survey analysis

Based on small sample survey data for the years 2012 and 2013, we conduct a correlation analysis between the rank-and-file employees' ESOP participation and average responses to PO-related questions in organizational units. The questions were: (1) *I fully* support *the* [name of the firm] *values*; (2) *I believe strongly in the goals and objectives of* [name of the firm]; and (3) *I am willing to put in a great deal of effort beyond what is normally expected*. These questions strongly relate to acts of citizenship, personal sacrifice, and experienced responsibility, which Pierce et al. (2003) describe as the outcomes of PO. In unreported results, we find that ESOP participation is positively correlated with all three statements at the 1% level. A confirmatory factor analysis shows that the questions load significantly on the same factor (i.e., PO), with all loadings above 0.8, demonstrating high internal consistency. In sum, ESOP participation appears to be closely linked to rank-and-file employees' PO.

6.1.2. Stratified subsample analyses

Nonetheless, ESOP participation could also be the outcome of pre-existing PO. In this case, individuals would have come to develop PO for the firm beforehand and would therefore invest in the ESOP. We build on PO theory that highlights three specific

[24] In unreported regressions, we find that the results also hold when we include interaction terms between *ESOP Participation* and the country-level variables.

Table 6
Sensitivity tests – Propensity score matched sample analysis.

VARIABLES	(1)	(2)	(3)
	Firm Exit	Firm Exit	Firm Exit
ESOP Participation	−0.025***	−0.025***	−0.025***
	(-25.646)	(-25.584)	(-25.607)
ESOP Participation * Labor Market Conditions		−0.002***	
		(-6.982)	
Labor Market Conditions		0.001**	
		(2.261)	
ESOP Participation * Uncertainty Avoidance			0.000***
			(4.091)
Uncertainty Avoidance			−0.000***
			(-3.101)
Gender	0.001	0.001	0.001
	(0.924)	(0.866)	(0.809)
Age	0.000	0.000	0.000
	(0.673)	(0.668)	(0.625)
Tenure	−0.006***	−0.006***	−0.006***
	(-7.746)	(-7.724)	(-7.678)
Education	0.002*	0.002*	0.003**
	(1.811)	(1.859)	(1.973)
Total Cash	0.005**	0.005**	0.005**
	(2.201)	(2.214)	(2.019)
Hierarchy Level	−0.003**	−0.003**	−0.003**
	(-2.547)	(-2.553)	(-2.541)
Administration	0.001	0.001	0.001
	(0.276)	(0.287)	(0.256)
Production	−0.002	−0.002	−0.002
	(-0.736)	(-0.737)	(-0.722)
R&D	−0.002	−0.002	−0.002
	(-0.642)	(-0.632)	(-0.683)
Sales	−0.001	−0.001	−0.001
	(-0.299)	(-0.302)	(-0.313)
Group Behavior	0.826***	0.826***	0.826***
	(75.858)	(75.846)	(75.858)
Organizational Unit Size	−0.001**	−0.001**	−0.001**
	(-2.301)	(-2.297)	(-2.164)
Intercept	0.045**	0.038	0.046**
	(1.996)	(1.610)	(2.013)
Year fixed effects	Yes	Yes	Yes
Business unit fixed effects	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes
N	146,204	146,204	146,204
Adjusted R^2	0.19	0.19	0.19

Notes: This table reports OLS regression analyses of the employees' ESOP participation (*ESOP Participation*) on the firm exit decision (*Firm Exit*) and the moderating effects of *Labor Market Conditions* and *Uncertainty Avoidance*. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. Robust standard errors are clustered at the employee level and *t*-statistics are provided in parentheses. Appendix A provides definitions and data sources for the regression variables.

experiences through which members of an organization come to feel PO: (1) investing in the target, (2) controlling the target, and (3) knowing the target (e.g., Pierce et al., 2001). Due to their position, senior managers are more likely to have these experiences in their daily business and hence feel PO. In contrast, rank-and-file employees are less likely to have these experiences. However, ESOP participation reflects a major opportunity to have these experiences and develop a stronger sense of PO, which is why we focus on ESOP participation of rank-and-file employees.

To support our arguments in line with PO theory, we conduct stratified subsample analyses to distinguish between groups that have varying degrees of experiencing PO in their daily business, leading to varying degrees of pre-existing PO. Specifically, we contrast groups that are less likely with such that are more likely to possess pre-existing PO. We expect the retention effect for those with low pre-existing PO to be more pronounced as this would indicate that the retention effect is more likely to be the result of PO arising from the ESOP participation and not from other sources, such as pre-existing PO.

First, we run a subsample analysis stratified by senior managers and rank-and-file employees. In line with our arguments, rank-and-file employees should have a weaker sense of PO than senior managers, which is why PO-related experiences arising from ESOP participation should have a stronger retention effect. Panel A in Table 8 presents the results. For both subsamples, we find a negative and significant relation between *ESOP Participation* and *Firm Exit*. The coefficient for *ESOP Participation* is −0.025 (−0.109) for the rank-and-file employees and −0.022 (−0.035) for senior managers using OLS (2SLS). While the effects are larger for rank-and-file employees, the Wald tests of the coefficient differences fail to report them as significant. As senior managers participate in the ESOP with much larger amounts (absolute and relative to their income), we assume that, for them, the economic aspects of ESOP participation will be more pronounced. For rank-and-file employees, who only invest very small amounts, we expect the arising PO effects to be more pronounced.

Second, we run regressions using subsamples stratified by white- and blue-collar rank-and-file employees. Our premise is that white-collar employees will have more PO-building experiences in their daily business, while for blue-collar employees, ESOP participation represents a rare opportunity to have PO-building experiences. Thus, for blue-collar employees we expect ESOP

Table 7
Sensitivity tests – Country-level variables.

Panel A: OLS regressions			
VARIABLES	(1)	(2)	(3)
	Firm Exit	Firm Exit	Firm Exit
ESOP Participation	−0.024***	−0.024***	−0.023***
	(-35.066)	(-34.882)	(-33.271)
ESOP Participation * Labor Market Conditions		−0.002***	
		(-9.524)	
Labor Market Conditions		0.000**	
		(2.103)	
ESOP Participation * Uncertainty Avoidance			0.000
			(4.805)
Uncertainty Avoidance	−0.000***	−0.000***	−0.000***
	(-6.370)	(-5.926)	(-6.877)
Individualism	−0.000***	−0.000***	−0.000***
	(-3.251)	(-2.977)	(-3.176)
Power Distance	−0.000	−0.000	−0.000
	(-1.617)	(-1.113)	(-1.359)
Masculinity	−0.000	−0.000	−0.000
	(-1.672)	(-1.231)	(-1.823)
Long-term Orientation	0.000***	0.000***	0.000***
	(7.660)	(6.970)	(7.581)
Stocks Traded	−0.000	−0.000	−0.000
	(-3.200)	(-3.084)	(-3.221)
Common Law	−0.005**	−0.006**	−0.006
	(-2.263)	(-2.361)	(-2.314)
ASD	−0.003	−0.004	−0.004
	(-0.928)	(-0.927)	(-0.953)
GDP Growth	0.000	0.000	0.000
	(1.035)	(0.754)	(0.984)
Workers' Rights	0.004***	0.003***	0.004***
	(4.868)	(4.279)	(4.892)
Intercept	0.023**	0.026***	0.024**
	(2.401)	(2.674)	(2.525)
Controls	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Business unit fixed effects	Yes	Yes	Yes
N	654,706	654,706	654,706
Adjusted R^2	0.24	0.24	0.24
Panel B: 2SLS regressions			
VARIABLES	(1)	(2)	(3)
	Firm Exit	Firm Exit	Firm Exit
ESOP Participation	−0.532***	−0.566***	−0.497***
	(-6.709)	(-7.128)	(-6.274)
ESOP Participation * Labor Market Conditions		−0.017***	
		(-10.151)	
Labor Market Conditions		0.001***	
		(3.343)	
ESOP Participation * Uncertainty Avoidance			0.003***
			(12.287)
Uncertainty Avoidance	−0.001***	−0.001	−0.001***
	(-8.518)	(-8.205)	(-8.660)
Individualism	−0.001***	−0.001***	−0.001***
	(-6.947)	(-7.041)	(-6.488)
Power Distance	−0.001***	−0.001***	−0.001***
	(-6.665)	(-6.722)	(-5.565)
Masculinity	−0.000	0.000	−0.000***
	(-1.492)	(0.468)	(-4.697)
Long-term Orientation	0.001***	0.000***	0.000***
	(9.253)	(7.849)	(8.086)
Stocks Traded	−0.000***	−0.000***	−0.000***
	(-7.057)	(-7.254)	(-7.010)
Common Law	−0.033***	−0.038	−0.035
	(-6.777)	(-7.781)	(-7.104)
ASD	0.004	0.006	0.006
	(0.923)	(1.518)	(1.573)
GDP Growth	−0.000	−0.000	−0.000
	(-0.611)	(-1.554)	(-1.377)
Workers' Rights	0.005***	0.003***	0.005***
	(5.901)	(3.039)	(5.688)

Table 7 (*continued*)

Panel B: 2SLS regressions			
VARIABLES	(1)	(2)	(3)
	Firm Exit	Firm Exit	Firm Exit
Intercept	0.147***	0.097***	0.049***
	(6.844)	(6.748)	(4.280)
Controls	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Business unit fixed effects	Yes	Yes	Yes
N	654,706	654,706	654,706
Adjusted R^2	0.24	0.24	0.24

Notes: This table reports regression analyses of the employees' ESOP participation (*ESOP Participation*) on the firm exit decision (*Firm Exit*) and the moderating effects of *Labor Market Conditions* and *Uncertainty Avoidance*. Panel A reports regressions using OLS. Panel B reports regressions using 2SLS. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. Robust standard errors are clustered at the employee level and *t*-statistics are provided in parentheses. Appendix A provides definitions and data sources for the regression variables.

participation to give rise to PO and to have a stronger retention effect. Panel B in Table 8 presents the results in line with our arguments. That is, the coefficients for *ESOP Participation* are significantly larger for blue-collar employees (−0.026 (−0.113) compared to −0.012 (−0.057) using OLS (2SLS)).

Third, we use subsamples stratified by tenure. We expect rank-and-file employees with low tenure to have had fewer opportunities to build PO in their short time with the firm compared to more tenured colleagues. Thus, for new employees, ESOP participation should have a stronger influence on their PO and their decision to stay with the firm. The results in Panel C in Table 8 confirm our expectations. The coefficients for *ESOP Participation* significantly decrease with increasing tenure (from low to high).

Fourth, we stratify the subsamples by income. We expect higher paid rank-and-file employees to, on average, work in positions with greater responsibilities, allowing them to develop a stronger sense of PO in their daily business. Thus, for lower paid employees, we expect ESOP participation to have a stronger effect on feeling PO and remaining with the firm. Panel D in Table 8 shows a significantly stronger relation between *ESOP Participation* and *Firm Exit* for rank-and-file employees with lower compared to higher incomes (−0.024 (−0.369) compared to −0.015 (−0.034) using OLS (2SLS)).[25]

6.2. The retention effect of small ESOP investment amounts

In contrast to managers on higher hierarchical levels, the income of rank-and-file employees is lower, and so is their investment in the ESOP in absolute and relative terms. Fortunately, we were able to obtain additional data, including employees' investment amounts and compensation for the year 2018. The data show that the average investment amount is 2.25% of rank-and-file employees' income, with minimum values of around 0.01%.[26] We assume that rank-and-file employees' small investment amounts are hardly likely to be an economic motivator due to their size. However, following the literature on PO (e.g., Dawkins et al., 2017), we expect that small investment amounts already lead to a sense of PO and thus retain rank-and-file employees. Based on the additional data, we create the dummy variable *Small Investment*, which takes the value of 1 if the employee invests less than 0.5%/1%/2% of his/her income (based on the median annual income of €52,083, this translates into amounts equaling €260/€521/€1,042) and 0 otherwise. As employees keep the purchased shares in the case of a firm exit and only forfeit the matching shares, the forfeited economic benefit would be one-third of the investment amount (i.e., €87/€147/€347). We consider these small investments to be very unlikely to act as economic motivators. We then run a test to estimate the effect of *Small Investment* on *Firm Exit*.[27] Table 9 reports the results. We find that all versions of *Small Investment* have a negative and significant effect on *Firm Exit* and thus lower employees' likelihood of leaving the firm, thus indicating the relevance of PO for rank-and-file employees.

6.3. The retention effect of ESOP participation over time

Many previous economic studies that investigate the stock ownership of executives and broader groups of employees suggest that the retention effect is limited to the vesting period (Aldatmaz et al., 2018; Balsam et al., 2007; Oyer & Schaefer, 2005). As the concept of PO builds and persists over time (Pierce et al., 2001), it potentially exceeds the effect of a vesting period (in the focal firm, the vesting period is three years). An adequate test of PO would examine the retention effect of past ESOP participation beyond the vesting period. However, ESOP participation is likely serially correlated, as pre-existing PO from past ESOP participations potentially fosters future ESOP participation, as evidenced by the use of the *xtserial* command in Stata. Therefore, we orthogonalized current as well as past ESOP participations to accommodate their inclusion in the same regression model. In this way, we investigated the lasting retention effect of past ESOP participation while controlling for current ESOP participation. Given that we measure our dependent variable (i.e., *Firm Exit*) in $t + 1$, the models using ESOP participation beyond $t - 1$ show expired vesting periods. Table 10 presents the results. The results using OLS in Panel A show negative and highly significant coefficients for each lagged version of *ESOP Participation*. The results using 2SLS in Panel B show negative and mostly significant coefficients for *ESOP Participation* which also extend beyond the vesting period. The results suggest a lasting

[25] In unreported descriptive analyses, we find additional results consistent with our expectations: Employee groups that are less likely to have a stronger sense of PO based on their daily business, are less likely to participate in the ESOP. That is, a smaller share of rank-and-file employees participates in the program compared to senior managers. Less blue-collar workers participate than white-collar workers. New employees are less likely to participate than tenured employees. More highly-paid employees enroll in the ESOP than lower-paid employees. These findings further support that our results are not driven by pre-existing PO of rank-and-file employees.

[26] In contrast, senior managers, on average, invest 27.37% of their bonus. Given that the average bonus is €60,000, senior managers' average annual investment in the ESOP is €16,422 and thus much higher than rank-and-file employees' average investment of €1172.

[27] Due to a change in the independent variable from *ESOP Participation* to *Small Investment*, we were not able to use the fitted values of *ESOP Participation* and conduct the 2SLS regressions.

Table 8
Additional tests – PO arising from ESOP participation.

Panel A: Subsample analysis stratified by senior managers and rank-and-file employees				
	OLS regressions		2SLS regressions	
Dependent Variable: Firm Exit				
Sample stratified by	Senior Managers	R&F Employees	Senior Managers	R&F Employees
ESOP Participation	-0.022	-0.025	-0.035	-0.109
Controls	Yes	Yes	Yes	Yes
N	7,156	654,706	7,156	654,706
Adjusted R^2	0.30	0.24	0.30	0.24
Wald-test coefficient, difference of ESOP Participation	$\chi^2(1) = 0.66$		$\chi^2(1) = 0.53$	
Panel B: Subsample analysis stratified by white-collar and blue-collar rank-and-file employees				
	OLS regressions		2SLS regressions	
Dependent Variable: Firm Exit				
Sample stratified by	White-Collar	Blue-Collar	White-Collar	Blue-Collar
ESOP Participation	-0.012	-0.026	-0.057	-0.113
Controls	Yes	Yes	Yes	Yes
N	112,242	542,464	112,242	542,464
Adjusted R^2	0.15	0.25	0.15	0.25
Wald-test coefficient, difference of ESOP Participation	$\chi^2(1) = 120.84^{***}$		$\chi^2(1) = 4.80^{**}$	
Panel C: Subsample analysis stratified by tenure				
	OLS regressions		2SLS regressions	
Dependent Variable: Firm Exit				
Sample stratified by	Low	Medium	High	Low	Medium	High
ESOP Participation	-0.028	-0.024	-0.021	-0.368	-0.105	-0.061
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	220,932	212,400	221,374	220,932	212,400	221,374
Adjusted R^2	0.22	0.23	0.27	0.22	0.23	0.27
Wald-test coefficient, difference of ESOP Participation for High versus Low	$\chi^2(1) = 16.72^{***}$			$\chi^2(1) = 125.07^{***}$		
Panel D: Subsample analysis stratified by income						
	OLS regressions			2SLS regressions		
Dependent Variable: Firm Exit						
Sample stratified by	Low	Medium	High	Low	Medium	High
ESOP Participation	-0.024	-0.014	-0.015	-0.369	-0.022	-0.034
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	42,693	42,693	42,963	42,693	42,693	42,963
Adjusted R^2	0.24	0.27	0.25	0.24	0.27	0.25
Wald-test coefficient, difference of ESOP Participation for High versus Low	$\chi^2(1) = 3.20^{*}$			$\chi^2(1) = 4.71^{**}$		

Notes: This table reports both OLS and 2SLS regression analyses of the employees' ESOP participation (*ESOP Participation*) on the firm exit decision (*Firm Exit*) on stratified subsamples. Panel A uses subsamples stratified by senior managers and rank-and-file employees. Panel B uses subsamples stratified by white-collar and blue-collar rank-and-file employees. Panel C uses subsamples stratified by tenure. Panel D uses subsamples stratified by income. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. Robust standard errors are clustered at the employee level and *t*-statistics are provided in parentheses. Appendix A provides definitions and data sources for the regression variables.

effect going beyond the vesting period and the economic arguments.

7. Conclusion

High turnover rates resulting in significant costs for firms emphasize the importance of a better understanding of individual employees' turnover decisions (Autrey, Bauer, Jackson, & Klevsky, 2019; Hansen, 1997; Zheng & Lamond, 2010). Considerable research has looked into the retention effect of stock ownership for higher-level employees. However, there has been very little research on the effects of individuals' ESOP participation decisions on the individual turnover behavior of rank-and-file employees and none outside the US. Using unique data from an industrial firm with subsidiaries worldwide, we provide evidence for the retention effect of rank-and-file employees' individual ESOP participation on a global scale. Further, we find that ESOP participation is much more effective in retaining rank-and-file employees under favorable labor market conditions and in cultures with lower levels of UA. Our findings emphasize the importance of labor market conditions and cultural values when looking at the effectiveness of incentive systems.

Our study contributes to the literature in several ways. First, we add to extant research investigating the effect of ESOP participation on employee turnover (Aldatmaz et al., 2018; Balsam et al., 2007; Pierce et al., 1991), as our study provides empirical evidence for ESOPs' retention effect for rank-and-file employees on an individual level. Second, we add to a growing body of accounting research that studies the incentive effects of ESOP participation among rank-and-file employees (Call et al., 2016; Holderness, Huffman, & Lewis-

Table 9
Additional tests – The retention effect of PO from small ESOP investments.

VARIABLES	(1)	(2)	(3)
	Firm Exit	Firm Exit	Firm Exit
Small Investment defined as less than … of income	0.5%	1%	2%
Sample	Investment & Income Data	Investment & Income Data	Investment & Income Data
Small Investment	−0.013***	−0.013***	−0.014***
	(-2.874)	(-7.372)	(-11.649)
Gender	−0.005***	−0.005***	−0.005***
	(-4.404)	(-4.404)	(-4.336)
Age	0.001***	0.001***	0.001***
	(19.471)	(19.424)	(19.327)
Tenure	−0.017***	−0.017***	−0.017***
	(-21.716)	(-21.746)	(-21.726)
Education	−0.001	−0.001	−0.001
	(-0.827)	(-0.836)	(-0.848)
Total Cash	−0.002	−0.001	−0.001
	(-0.359)	(-0.274)	(-0.175)
Hierarchy Level	1.102***	1.102***	1.102***
	(117.410)	(117.401)	(117.403)
Administration	0.001**	0.001*	0.001*
	(1.974)	(1.900)	(1.834)
Production	−0.003**	−0.003**	−0.003**
	(-2.070)	(-2.066)	(-1.960)
R&D	−0.000	−0.000	−0.000
	(-0.150)	(-0.164)	(-0.169)
Sales	0.002	0.002	0.002
	(0.710)	(0.693)	(0.735)
Group Behavior	−0.001	−0.001	−0.001
	(-0.231)	(-0.249)	(-0.242)
Organizational Unit Size	0.000	0.000	0.000
	(0.091)	(0.090)	(0.102)
Intercept	−0.015***	−0.014***	−0.012***
	(-3.613)	(-3.385)	(-2.980)
Year fixed effects	Yes	Yes	Yes
Business unit fixed effects	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes
N	236,787	236,787	236,787
Adjusted R^2	0.18	0.18	0.18

Notes: This table reports OLS regression analyses of small ESOP investments (*Small Investment*) on the firm exit decision (*Firm Exit*). The sample used in these regressions is restricted to observations with individual income data. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. Robust standard errors are clustered at the employee level and t-statistics are provided in parentheses. Appendix A provides definitions and data sources for the regression variables.

Western, 2019) by proposing the theory of PO that should be particularly relevant for employees with lower incomes. Thereby, with ESOPs, our study provides an alternative to create an emotional attachment of employees with the firm. Third, we extend the scope of prior studies on the retention effect of ESOPs from a purely US setting to a cross-country setting (Aldatmaz et al., 2018; Balsam & Miharjo, 2007; Kim & Ouimet, 2014; Oyer & Schaefer, 2005). The results highlight rank-and-file employees' sensitivity in their turnover intentions.

Our study has several limitations but also provides opportunities for future research. First, our study particularly builds on the argument of a retention effect through PO that arises from ESOP participation. Unfortunately, we cannot directly measure PO, which potentially leaves room for alternative explanations (e.g., pre-existing PO). Similarly, the decision to participate in ESOPs and the decision to leave the firm could be simultaneously determined by an omitted variable. Therefore, we run a battery of tests, which support our arguments and results. For example, survey data, cross-sectional tests, and tests on the retention effect of very small investment amounts strongly suggest PO as the underlying mechanism. In addition, 2SLS regressions and an ITCV analysis provide confidence in our inferences. However, as we have no experimental setting at hand, we cannot completely rule out the possibility of endogeneity or an alternative explanation. Following a recent study by Hanlon et al. (2021), future research could dive deeper into the mechanism behind the observed employee behavior and adopt alternative research approaches (e.g., exploiting natural experiments). Second, based on our evidence on the retention effect of ESOP participation, we cannot determine whether ESOPs retain the "right" employees. While prior research discusses the relationship between HR practices and turnover rates of good and poor performers (Shaw, Dineen, Fang, & Vellella, 2009), future research could explore the job performance of the various employee groups (e.g., non-participating and leaving).

Our findings also have practical implications for globally operating firms, as firms often implement homogenous incentive systems to retain employees across countries (GEO, 2019). Our findings suggest that the effectiveness of incentive systems differs with the institutional setting. If an incentive system works in the home country, it may not have the same effect in other countries. Consequently, firms need to carefully assess their global implementation strategies for their incentive systems. Moreover, in line with a recent study by Autrey et al. (2019), our study points firms

Table 10
Additional tests – The retention effect of PO from past ESOP participation.

Panel A: OLS regressions					
VARIABLES	(1)	(2)	(3)	(4)	(5)
	Firm Exit	Firm Exit	Firm Exit	Firm Exit	Firm Exit
ESOP Participation	−0.008***	−0.009***	−0.010***	−0.010***	−0.010***
	(-26.099)	(-23.405)	(-20.646)	(-15.128)	(-13.679)
ESOP Participation in t-1	−0.007***				−0.003***
	(-21.006)				(-4.901)
ESOP Participation in t-2		−0.006***			−0.002***
		(-16.324)			(-3.065)
ESOP Participation in t-3			−0.003***		−0.003***
			(-5.768)		(-4.658)
ESOP Participation in t-4				−0.003***	−0.002**
				(-4.549)	(-2.049)
Gender	−0.000	−0.001	−0.003**	−0.007***	−0.006***
	(-0.184)	(-0.932)	(-2.411)	(-3.456)	(-2.890)
Age	0.000***	0.000***	0.000***	0.001***	0.001***
	(4.853)	(3.993)	(3.468)	(5.034)	(5.727)
Tenure	−0.018***	−0.016***	−0.017***	−0.016***	−0.016***
	(-27.333)	(-18.688)	(-14.504)	(-9.054)	(-8.829)
Education	0.002*	0.002	0.002	0.004*	0.003
	(1.726)	(1.149)	(0.960)	(1.661)	(1.318)
Total Cash	0.009***	0.007***	0.002	−0.002	−0.001
	(4.759)	(3.245)	(0.693)	(-0.540)	(-0.306)
Hierarchy Level	−0.003***	−0.003**	−0.003*	−0.003	−0.003
	(-2.581)	(-2.012)	(-1.646)	(-1.095)	(-1.324)
Administration	0.003	0.005**	0.004	0.005	0.005
	(1.425)	(1.992)	(1.435)	(1.273)	(1.099)
Production	0.001	0.001	0.000	0.002	0.002
	(0.360)	(0.297)	(0.010)	(0.373)	(0.454)
R&D	0.003	0.005**	0.004	0.006	0.006
	(1.597)	(2.269)	(1.397)	(1.412)	(1.397)
Sales	0.000	0.001	0.003	0.004	0.003
	(0.061)	(0.265)	(1.090)	(0.878)	(0.769)
Group Behavior	1.049***	1.054***	0.893***	0.861***	0.851***
	(205.288)	(159.381)	(96.779)	(60.643)	(58.616)
Organizational Unit Size	−0.001*	0.000	−0.002***	−0.003***	−0.004***
	(-1.947)	(0.655)	(-3.088)	(-3.327)	(-3.604)
Intercept	0.022**	0.029*	0.038**	0.036	0.039
	(2.055)	(1.853)	(2.468)	(1.619)	(1.641)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Employee fixed effects	No	No	No	No	No
Subsidiary fixed effects	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes
N	460,437	297,666	179,396	80,646	77,450
Adjusted R^2	0.25	0.25	0.16	0.14	0.14

Panel B: 2SLS regressions					
VARIABLES	(1)	(2)	(3)	(4)	(5)
	Firm Exit	Firm Exit	Firm Exit	Firm Exit	Firm Exit
ESOP Participation	−0.002**	−0.010***	−0.006***	−0.004*	−0.003**
	(-1.965)	(-5.142)	(-3.879)	(-1.755)	(-2.439)
ESOP Participation in t-1	−0.013***				−0.002*
	(-5.992)				(-1.691)
ESOP Participation in t-2		−0.009***			−0.000
		(-3.724)			(-0.302)
ESOP Participation in t-3			−0.010***		−0.000
			(-3.223)		(-0.281)
ESOP Participation in t-4				−0.005	−0.004*
				(-1.173)	(-1.684)
Gender	0.003**	0.001	−0.001	−0.006***	−0.005**
	(2.498)	(0.861)	(-0.664)	(-2.654)	(-2.504)
Age	0.000***	0.000***	0.000***	0.001***	0.001***
	(5.976)	(4.599)	(4.128)	(5.267)	(6.082)
Tenure	−0.017	−0.016***	−0.016***	−0.016***	−0.016***
	(-24.215)	(-16.982)	(-13.196)	(-8.627)	(-8.576)
Education	0.009***	0.007***	0.008***	0.006	0.005
	(4.868)	(3.294)	(2.766)	(1.580)	(1.587)
Total Cash	0.021***	0.020***	0.016***	0.004	0.005
	(6.338)	(4.802)	(2.954)	(0.603)	(0.880)
Hierarchy Level	0.007***	0.007	0.008*	0.002	0.001
	(2.934)	(2.219)	(1.935)	(0.351)	(0.151)
Administration	0.005**	0.006***	0.006**	0.006	0.005

Table 10 (*continued*)

Panel B: 2SLS regressions					
VARIABLES	(1)	(2)	(3)	(4)	(5)
	Firm Exit	Firm Exit	Firm Exit	Firm Exit	Firm Exit
	(2.417)	(2.672)	(1.996)	(1.420)	(1.158)
Production	−0.000	0.000	−0.001	0.001	0.001
	(-0.135)	(0.026)	(-0.281)	(0.222)	(0.230)
R&D	0.008***	0.010***	0.009***	0.008*	0.008*
	(3.534)	(3.684)	(2.697)	(1.750)	(1.728)
Sales	0.003	0.003	0.006*	0.005	0.004
	(1.609)	(1.311)	(1.934)	(1.060)	(0.865)
Group Behavior	1.046***	1.040***	0.880***	0.855***	0.844***
	(181.779)	(141.760)	(88.501)	(56.394)	(55.821)
Organizational Unit Size	−0.002***	−0.000	−0.003***	−0.003***	−0.004***
	(-3.838)	(-0.716)	(-3.915)	(-3.209)	(-3.535)
Intercept	−0.004	−0.001	0.011	0.026	0.035
	(-0.361)	(-0.054)	(0.578)	(0.997)	(1.448)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Employee fixed effects	No	No	No	No	No
Subsidiary fixed effects	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes
N	460,437	297,666	179,396	80,646	77,450
Adjusted R^2	0.25	0.25	0.16	0.14	0.14

Notes: This table reports regression analyses of the employees' ESOP participation (*ESOP Participation*) on the firm exit decision (*Firm Exit*) with varying lags for the independent variable ranging from t to t-4. Panel A reports regressions using OLS. Panel B reports regressions using 2SLS. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. Robust standard errors are clustered at the employee level and t-statistics are provided in parentheses. Appendix A provides definitions and data sources for the regression variables.

toward psychological attachment as a mechanism beyond economic arguments to aid in employee retention. This allows for implications for firms' ESOP design regarding target groups, investment amounts, and communication.

Appendix A

Variable overview, descriptions, and data sources.

Variable	Description	Source
Dependent variable		
Firm Exit	An indicator variable equal to 1 if the employee left the firm in the year t + 1, namely, after his/her decision to participate in the offered ESOP or not, and 0 otherwise.	Internal firm HR database
Independent variable		
ESOP Participation	An indicator variable equal to 1 if the individual employee decided to participate in the ESOP in year t and 0 otherwise.	Internal firm ESOP database
Instrumental variable		
Financial Literacy	Financial literacy is a country-level variable and has been obtained from the Standard & Poor's Ratings Services Global Financial Literacy Survey. The survey was conducted in cooperation with Gallup Inc. and is based on over 150,000 interviews with representative adults in more than 140 countries. We follow Klapper et al. (2014) and Meoli et al. (2021) in measuring financial literacy as the percentage of adults who are financially literate in one country.	S&P Global FinLit Survey
Moderator variables		
Labor Market Conditions	Unemployment rate as a percentage of total labor force per country.	Worldbank
Uncertainty Avoidance	The uncertainty avoidance (UA) index by Hofstede captures the extent to which people in a country feel threatened by uncertainty and attempt to avoid ambiguous situations. A higher score indicates a higher degree of UA. Hofstede used questions regarding (1) stress, (2) employment stability, and (3) rule orientation to calculate the index: (1) How often do you feel nervous or tense at work? (1. Always … to 5. Never); (2) How long do you think you will continue working for this company (1. Two years … to 4. Until retirement); and (3) Company rules should not be broken—even when the employee thinks it is in the company's best interests (1. Strongly agree … to 5. Strongly disagree). Based on the answers, Hofstede used the following formula to calculate the country scores: UAI = 300 −30 × (mean score rule orientation) − (% intending to stay less than 5 years) − 40 × (mean stress score).	Hofstede (1984, 1994)
Control variables		
Gender	An indicator variable equal to 1 if the employee is male and 0 otherwise.	Internal firm HR database
Age	Age in years for the individual employee.	Internal firm HR database
Tenure (log)	Natural logarithm of the tenure in years for the individual employee.	Internal firm HR database
Education	An indicator variable equal to 1 if the employee has a master's degree and 0 otherwise.	Internal firm HR database
Total Cash	The employee's income calculated as the average total cash (fixed and variable components of income) for each of the 177 sub-job families per country. The calculation is based on the assumption that employees with similar tasks in the same country earn similar incomes.	Internal firm HR database
Hierarchy Level	An indicator variable equal to 1 if the employee belongs to one of two higher hierarchy levels among the rank-and-file employees (still below senior management) and 0 otherwise.	Internal firm HR database
Administration	An indicator variable equal to 1 if the employee works in administration and 0 otherwise.	Internal firm HR database

(*continued on next page*)

(*continued*)

Variable	Description	Source
Production	An indicator variable equal to 1 if the employee works in production and 0 otherwise.	Internal firm HR database
R&D	An indicator variable equal to 1 if the employee works in R&D and 0 otherwise.	Internal firm HR database
Sales	An indicator variable equal to 1 if the employee works in sales and 0 otherwise.	Internal firm HR database
Group Behavior	Proportion of leaving employees within the organizational unit, calculated by the sum of firm exits divided by the total number of employees per organizational unit.	Own calculation based on internal firm HR database
Organizational Unit Size (log)	Natural logarithm of the number of employees in each organizational unit.	Internal firm HR database
Alternative country-level variables		
Stocks Traded	Total value of stocks traded per country as a percentage of the GDP.	Worldbank
Common Law	An indicator variable equal to 1 if the country has a common law origin.	Djankov et al. (2008)
ASD	The anti-self-dealing (ASD) index is a measure for the legal protection of minority shareholders against expropriation by corporate insiders. A higher score indicates higher protection of minority shareholders.	Djankov et al. (2008)
GDP Growth	The yearly GDP real growth rate on an annual basis adjusted for inflation and as a percentage per country.	CIA Factbook
Workers' Rights	Values per country from the 2016 International Trade Union Confederation (ITUC) global rights index. The index rates countries on a scale from 1 to 5 based on the degree of respect for workers' rights.	ITUC

Appendix B

Explanation of the focal firm's structure

For our analysis, we use data from a large industrial firm based in Europe with subsidiaries worldwide. In the following, we explain the focal firm's structure in more detail to provide a better understanding of the firm itself, but also of the heterogeneity within the firm, and the resulting measures to control for it. The firm's heterogeneity provides good arguments for the generalizability of the results found in this study. At the same time, we have to control for specific characteristics of employees, organizational units, or business units to address the firm's heterogeneity in our empirical analyses.

Fig. A1 shows an excerpt of the firm's organizational structure (for illustrative purposes, the organigram only lists three divisions, three business units within one division, and five organizational units per business unit). As indicated by the divisions, the firm operates in a variety of industries (such as, for example, healthcare, mobility management, energy solutions, etc.). Within the divisions, there are multiple business units. A business unit can span multiple countries, and in one country there can be multiple business units. Since there can be some heterogeneity between the business units, we control for business unit fixed effects in our regressions.[28]

Within the business units, there are several organizational units. Organizational units describe the smallest structural elements in which employees are organized. Organizational units have a fixed location. However, there are no particular specializations within the countries apart from common country-specific characteristics (e.g., IT services in India). On the organizational-unit level, we account for *Organizational Unit Size* and *Group Behavior*, which is the proportion of employee firm exits in the unit.

Within the organizational units, there can be employees from varying cross-functional job families. A job family describes a broader functional area that includes various sub-job families. For example, the job family “sales” includes the sub-job family “key account management,” while “R&D” includes “software development.” Thus, the sub-job family is a more precise description of an employee's function. On the employee level, we add indicator variables that cluster the job families within the cross-functional areas of *Administration*, *Production*, *R&D*, and *Sales*, while we omit the area of *Procurement*. As we were not able to obtain individual income data for all employees, we assumed that employees' income per sub-job family and country was comparable and calculated the respective average income (i.e., *Total Cash*). Moreover, we included employees' *Hierarchy Level*, *Gender*, *Age*, *Tenure*, and *Education*.

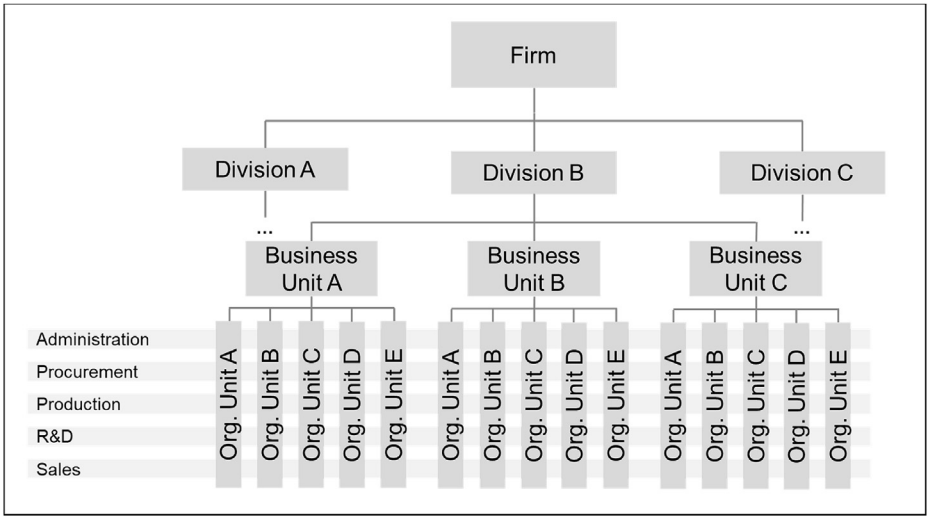

Fig. A1. Excerpt of the focal firm's organizational structure

[28] We thank an anonymous reviewer for this insightful suggestion.

Appendix C

Country values for uncertainty avoidance and average unemployment rate in percent.

Country	Hofstede's uncertainty avoidance index	Average unemployment rate (in %)
Australia	51	5.72
Austria	70	5.53
Belgium	94	8.19
Brazil	76	7.93
Canada	48	7.05
Chile	86	6.33
China	30	4.06
Czech Republic	74	5.83
Denmark	23	6.67
Egypt	80	12.85
Finland	59	8.52
France	86	10.15
Hong Kong	29	3.33
Hungary	82	8.13
India	40	4.68
Indonesia	48	6.05
Ireland	35	11.70
Israel	81	6.00
Italy	75	11.69
Malaysia	36	3.05
Mexico	82	4.58
Netherlands	53	6.69
New Zealand	49	5.65
Norway	50	4.01
Philippines	44	6.53
Poland	93	8.96
Romania	90	6.71
Singapore	8	1.95
Slovakia	51	12.73
South Africa	49	25.82
South Korea	85	3.42
Spain	86	23.39
Sweden	29	7.66
Switzerland	58	3.12
Taiwan	69	4.06
Thailand	64	0.78
Turkey	85	9.74
United Kingdom	35	6.35
United States	46	6.47

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.aos.2022.101390.

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