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Vivien Lefebvre

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## **EMPLOYMENT GROWTH AND PROFITABILITY IN EUROPEAN SMEs: THE 100% SPEED LIMIT**

### **Abstract**

We investigated the relationship between employment growth and profitability and propose that small and medium-sized enterprises (SMEs) hire employees, they experience an increase in profitability due to their acquisition of additional human capital. These benefits, however, are limited by the firm's ability to efficiently integrate the newly recruited employees and adjust its internal managerial practices and organization accordingly. Using a large sample of SMEs in the European Union, we examined the relationship between employment growth and profitability as a quadratic function with an inverted U shape. The empirical results strongly supported our prediction as we observed that profitability decreased when SMEs exceeded a 100% growth rate in employment. Importantly, we observed strong homogeneity in our results across various industries. This paper empirically documents the “maximum” speed at which firms should grow and highlights the homogeneity of this result across industries.

**Keywords:** growth, employment, profitability, resources

### **1. Introduction**

Small- and medium-sized enterprises (SMEs) account for a large majority of new jobs and value creation in most countries. In the European Union (EU), SMEs represent 99% of all firms, create two out of three jobs, and generate one-half of the total GDP (European Commission 2020). Not surprisingly, public policies make concerted efforts to support the growth of SMEs and promote entrepreneurship, as shown by programs such as the “Small Business Act” in the EU, which is directed at fostering new business creation and generating

employment. There is thus strong demand for academic studies on firm growth that will inform public policies on how to identify practical channels through which employment can be improved. In response, research on high-growth firms—i.e., firms that achieve phases of intensive growth in sales or employment—has developed rapidly over the last 20 years (Birch and Medoff 1994; Moreno and Casillas 2007; Coad et al. 2014; Li et al. 2016; Coad, Cowling, and Siepel 2017; Dillen et al. 2019; Erhardt 2021). Whether episodes of high growth lead to greater efficiency and higher profitability is, however, a widely debated question (Delmar et al. 2013; Kuratko et al. 2020; Belitski et al. 2023).

The study of firm growth is a longstanding and fundamental area of research in the fields of entrepreneurship and strategic management. This is because growth is considered an important indicator of entrepreneurial success and performance (Brush, Bromiley, and Hendrickx 2000; Davidsson et al. 2009). Dominant theoretical frameworks in the study of growth, like the Penrosean theory of growth (hereafter PTG, Penrose 1959) and the resource-based view (Wernerfelt 1984; Barney 1991), focus on the role of resource acquisition and management to explain growth<sup>1</sup> and profitability. Notwithstanding the fact that it is of great importance to understand the factors that explain growth in employment, most entrepreneurs and managers view the recruitment of new employees as a means rather than an end. For entrepreneurs and managers, growth in sales and profits is the desired outcome of the growth process, while academics and public policies emphasize increased growth in employment as their “dependent variable” (Achtenhagen, Naldi, and Melin 2010). Notably, Penrose (1959), in her seminal book *The Theory of the Growth of the Firm*, explicitly assumed that the ultimate goal of managers through the growth process is the maximization of revenues and profits, not

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<sup>1</sup> Other important theories in firm growth research include the stage-of-growth theory by Greiner (1972) and the evolutionary theory by Jovanovic (1982). These theories are more common in economic research than management research.

the accumulation of resources, like human resources (HR). **Some confusion emerged in the growth literature about the respective roles of growth in HR, which corresponds to the acquisition of resources and is thus an antecedent of growth, and growth in sales, which is more an outcome of growth (McKelvie and Wiklund 2010). The starting point of our work is to view growth in HR as a resource-acquisition step that should lead to higher profits, and that is different from growth in sales. Actually, growth in sales is rather the consequence of growth in employment (Lefebvre, 2023).**

Previous studies on the growth process have mostly focused on the relationship between growth in sales and profitability. These studies have produced mixed results, as some authors have documented that profits increase after periods of growth in sales (Brush et al. 2000; Delmar et al. 2013; Coad et al. 2017), while others have reported that episodes of high growth in sales are followed by declines in performance (Markman and Gartner 2002; Davidsson et al. 2009; Ben-Hafaïedh and Hamelin 2023). The process through which firms grow and the dynamic imbrications of the different dimensions of firm growth are complex and not yet fully understood (Coad et al. 2017; Lefebvre 2023). One idea that has been relatively unexplored and insufficiently formalized in the growth literature is that firms can only efficiently capitalize on growth so long as the benefits associated with the presence of additional HR are greater than the costs associated with the adaptation of managerial practices and changes in the organizational structure caused by growth. Although many studies have explored the consequence of sales growth on a firm's profitability (Brush et al. 2000; Davidsson et al. 2009, Coad, Frankish, and Storey 2020; Ben-Hafaïedh and Hamelin 2023), few studies have considered how employment growth affects profitability.

**In their literature review, Demir et al. (2017) identified only one study (Senderovitz et al. 2016) that explicitly examined the relationship between employment growth and**

**profitability. Senderovitz et al. (2016) reported a positive relationship between growth in employment and profitability that is moderated by the nature of the strategy (niche strategy or broad market strategy). Recently, Lefebvre (2023) highlighted the imbrications of the different dimensions of growth and found partial support for the idea that the acquisition of additional resources, including HR, leads to larger sales. However, these studies did not acknowledge that there are limits to the benefits of growth, neither did they identify explicitly above which limit employment growth generates more organizational costs than resources benefits. Our work addresses this gap in the literature.**

Indeed, most studies have adopted a theoretical lens according to which the relationship between growth and profitability is a question of economies of scale, following Porter's (1980) seminal work. Firms that increase their sales faster than their competitors and reach critical size early on benefit from a first-mover competitive advantage that leads to profitability gains (Kuratko et al. 2020; Belitski et al. 2023). This widespread framework of the relationship between growth and profitability neglects the fact that growth in sales and in the resources controlled by a firm (like HR) are two different observations (Shepherd and Wiklund 2009). When firms acquire resources by, for instance, recruiting new employees, they do not gain economies of scale. Should firms recruit many employees in a short period of time (a high-growth episode), the challenges associated with the integration of these employees would challenge profitability. By comparison, it seems more natural to expect that a high-growth episode in sales would lead to higher profitability through economies of scale. In other terms, growth in sales likely leads to scaling, while it is not necessarily the case of growth in employment (Belitski et al. 2023).

We adopted a theoretical view based on the PTG and on the concept of resource versatility developed by Nason and Wiklund (2018) to argue that employment growth increases

profitability only up to a certain level, after which the challenges associated with the integration of newly recruited employees and the need to adapt HR management negatively affect profitability. In other words, we predicted that the relationship between growth in employment and profitability is quadratic, with an inverted U shape. We tested this hypothesis on a large sample of 288,437 European SMEs and found strong support for this prediction – namely, an optimal level of employment growth that maximizes profitability. Interestingly, this optimal level of growth is almost the same in all industries and is close to the symbolic 100% mark. In other words, firms should not more than double their workforce in one year. **We also examined the moderating played by the strength of labor rights protection laws (LRPLs). LRPLs can indeed both increase productivity (Gust and Marquez 2004) and thus play a positive moderating role in the relationship between employment growth and profitability. However, strong LRPLs also make HR “stickier” and less easily redeployable (Mishina, Pollock, and Porac 2004; Vanacker et al. 2017).**

The main contribution of this work is that it provides a conceptually motivated and empirically validated boundary condition on the idea that growth is beneficial to firm profitability. By focusing on growth in employment, and thus on the resource acquisition phase of growth instead of growth in sales, we clarify the analysis of the relationship between growth and profitability. By explicitly identifying above which limit growth in employment becomes detrimental to firm profitability, we provide managers with a clear benchmark of where to draw the line in their growth strategy. By showing that our results hold across various industries, we lend ecological validity to our arguments. **However, we found only partial evidence regarding the moderating role of LRPLs.**

In the rest of this paper, we first develop our theoretical arguments and hypothesis, after which we present our methodology. We next describe our main results, followed by a conclusion that highlights some limitations of our study as well as avenues for future research.

## **2. Theoretical framework and hypothesis development**

### **2.1. Growth and the PTG**

The dominant theoretical framework in the study of firm growth is certainly the PTG, which is focused on the role played by resources in the growth of firms. A major assumption in the PTG is that growth is endogenous to managers' behavior. In other words, managers are directed by the goal of long-term profit maximization, which creates the incentive to make the firm grow. Indeed, only when firms invest in new opportunities, and thus grow, do profits increase. It thus follows that "growth and profits become equivalent as the criteria for the selection of investment programmes" (Penrose 1959, 30). Put another way, the PTG relies on the hypothesis that growth is a managerially desired outcome. Whenever resources are available—for example, when a firm has excess resources in terms of cash or human capital—managers gradually learn how and are willing to use these resources to fuel growth and innovation. Not only does the presence of resources facilitate growth, it also motivates growth, if one assumes that managers have a profit-maximization attitude (Pitelis 2007).

There are, however, multiple dimensions to the concept of growth (McKelvie and Wiklund 2010). Growth can be measured as an increase in the number of employees of a firm or as increased sales turnover, profitability, and assets. Although intertwined, these various dimensions of growth are not interchangeable. For instance, it is well documented that the degree of correlation between growth measures is low. Shepherd and Wiklund (2009) observed that the correlation coefficient between sales growth and employment growth is approximately 0.34. Daunfeldt et al. (2014) made similar observations. Moreover, the study of growth,

especially if growth is viewed as a process, requires an adequate theoretical development that links the theory of growth to the growth measure under consideration (Achtenhagen et al. 2010; McKelvie and Wiklund 2010; Cassia and Minola 2012; Furlan, Grandinetti, and Paggiaro 2014).

It is therefore important to note that, from the viewpoint of PTG, among the various dimensions of growth, growth in sales and growth in profitability are mostly described as outcomes of the growth process, whereas growth in assets and employment represent the means—not the end—of the growth process (**Mishina et al. 2004; Achtenhagen et al. 2010**). Indeed, the manager's assumption of long-term profit maximization is based on the notion that making new investments and hiring new people will not only grow the firm, but make it more profitable. It follows that one of the most important limits to growth lies in the necessarily limited pool of resources firms have at a given point in time. Although firms, and especially smaller and younger ones, learn to optimize the use of existing resources (Helfat and Peteraf 2003; Sirmon, Hitt, and Ireland 2007) or to reallocate them to other, more productive purposes (Moran and Ghoshal 1999), at some point, new resources must be acquired to fuel growth (Sirmon and Hitt 2003). A direct consequence of the PTG is therefore that, because growth in profitability is a desired outcome, firms must acquire and leverage new resources (like employees) to promote growth<sup>2</sup> (Furlan et al. 2014).

In the next two sections, we present arguments that suggest (1) a positive relationship between growth in employment and profitability, and (2) a negative relationship between growth in employment and profitability when growth is rapid. Following the recommendations

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<sup>2</sup> Other views of growth as a process exist in the literature. For instance, Chandler, McKelvie, and Davidsson (2009) studied the reverse relationship (between growth in sales and growth in employment) using transaction costs theory as their theoretical framework. They argued that growth in employment is only possible if critical levels of sales and cash flows are previously reached because hiring new employees comes at a cost. Their paper focused on very small firms with an average of five employees.

of Haans, Pieters, and Zhe (2016), we combined both arguments to propose that there is an inverted U-shaped relationship between firm growth and profitability.

## **2.2. Human capital acquisition and versatility of resources**

Among all of the resources that are key to generating growth, the role played by human capital appears to have only been recently acknowledged in the strategic management literature (Wright, Dunford, and Snell 2001). According to Barney (1991), only when resources are rare, valuable, imperfectly inimitable, and substitutable will they generate a sustained competitive advantage leading to superior performance. With respect to human capital, Hatch and Dyer (2004) therefore indicated that only unit-specific human capital generates a competitive advantage. Unit-specific human capital refers to human capital that is not transferable across firms and whose value is strongly linked to the unit (the firm) itself (Barney and Wright 1998). For instance, human capital becomes specific when employees become more familiar with a given firm's processes (Hatch and Dyer 2004). However, the extent to which an employee is familiar with a firm's processes is not a skill that can be fruitfully used in another company, thereby making human capital a firm-specific resource. In a recent paper, Grillitsch and Schubert (2021) showed that the impact new recruits have on the founding team in terms of sales growth via the addition of new skills depends on the age of the firm. For startups, Grillitsch and Schubert (2021) reported a positive relation between the acquisition of new skills and sales growth, but a negative relationship for older, more established firms.

The view of human capital as expressed in the previous papers sees more generic human capital as playing a modest role in the establishment of competitive advantage. As argued by Ployhart, Van Iddekinge, and Mackenzie (2011), there is, however, a strong relationship between unit-specific human capital and generic human capital since a broader set of generic human capital facilitates the emergence of specific human capital. The contribution of generic

human capital to firm performance is not static over time because it is a resource that can be used in multiple ways and has some degree of versatility. It follows that enlarging generic human capital, which concretely means hiring more employees, enhances the emergence of unit-specific human capital, which in turn leads to higher performance.

Let us assume that a firm hires new employees. By doing so, the firm increases both its generic human capital, because the firm hires new employees, and its unit-specific human capital. The increase in unit-specific human capital is twofold. First, it is possible that highly skilled people are hired (direct channel). Second, because the generic human capital has increased, the emergence of unit-specific human capital (indirect channel) is facilitated (Ployhart et al. 2011). Following the PTG, the renewal of the resource set of the firm will facilitate the provision of new resources that will in turn foster sales growth, **and ultimately profitability (Penrose 1959; Davidsson et al. 2009; Ben Hafaïedh and Hamelin 2023).**

Recent developments of the PTG (Nason and Wiklund 2018) have highlighted that versatile resources play a greater role in explaining growth than rare, valuable, inimitable, and imperfectly substitutable resources, as in Barney's (1991) famous paper. We argue that human capital is another versatile resource that aligns with the PTG. Versatile resources are defined as "the range of potential services that a resource provides and, thus, incorporates not only generic and tradable resources that can be exchanged between firms but also idiosyncratic assets that can be redeployed by a specific firm into new arenas" (Nason and Wiklund 2018, 54). The key characteristic of versatile resources is that they can be reallocated for other purposes depending on the needs and opportunities identified by the firm. We do not suggest, however, that it is easy to redeploy human capital. As proposed by Mishina et al. (2004), versatile resources have different degrees of stickiness, and human capital is stickier, and thus less easily redeployable, than other resources, like cash. Nevertheless, it is precisely because the decision to hire new

employees is highly binding for firms that we expect growth in employment to be related to a subsequent gain in profitability. Indeed, once a firm metaphorically “crosses the Rubicon” of hiring employees, the level of fixed costs that corresponds to the increase in salaries makes it urgent to increase sales growth to cover these fixed costs.

There is a clear channel through which an increase in generic human capital can lead to growth in profitability. In most small, young, and fast-growing firms, managers and employees are multitasked and thus represent a versatile resource (Slevin and Covin 1998; Flamholtz and Randle 2000). When such firms hire new employees, they not only hire highly qualified and specialized people but also employees with more generic skills in, for example, administration and accounting. Doing so frees time for top managers to dedicate to the growth strategy of their firm because they can now focus less on time-consuming administrative tasks. Overall, the acquisition of new human capital represents an increase in a versatile resource that (1) releases top managers from time-consuming bureaucratic tasks, (2) corresponds to individuals who gradually learn firm-specific routines and processes, making them firm-specific human capital as well as a factor of efficiency and productivity, and (3) creates a strong incentive to increase profitability because such human capital increases the fixed costs of the firm as well as its operating risks. These arguments suggest a positive relationship between growth in employment and profitability.

### **2.3. When firms grow too fast: The negative effect of growth on profitability**

While growth in employment yields benefits, it is also associated with important limitations. First, there is a direct negative effect of employment growth on profitability because of increased payrolls. While obvious, this argument shows that the benefits obtained when increasing HR is counterbalanced by additional operating expenses.

Second, it seems important to acknowledge that the speed of growth conditions the ability of the firm to efficiently leverage newly acquired human capital. A very fast increase in employment may be a more destabilizing force than a profit-enhancing factor, at least in the short term (Gartner 1997). SMEs are by nature small and relatively agile organizations. A sudden episode of fast growth in employment requires new employees to be integrated in the firm, which consumes managerial efforts (**Covin and Slevin 1997; Alvarez and Barney 2005; Nicholls-Nixon, 2005**). SMEs must rethink their internal organization when they grow quickly and adopt new processes and practices, especially in terms of HR management (Storey et al. 2010; Lai, Saridakis, and Johnstone 2017). Several empirical studies have highlighted that high growth in employment episodes are not followed by gains in profitability—on the contrary, profitability can actually decline after high-growth phases, which is consistent with the idea that high growth destabilizes organizations (Markman and Gartner 2002; Davidsson et al. 2009; Coad et al. 2017).

In her seminal book, Penrose (1959, 19) noted that firms must adapt their internal structure and organization to deal with growth: “Apparently what has happened as firms have grown larger is not that they have become inefficient, but that with increasing size both the managerial function and the basic administrative structure have undergone fundamental changes which profoundly affect the nature of the ‘organism’ itself.” While Penrose (1959) acknowledged that growth, in terms of new resource acquisition, challenges the structure of the firm, she seemed to view the adjustments made to this structure as something that companies would certainly do. However, she was not explicit about the impact such changes would have, at least in the short run, on firm performance. While it seems reasonable to believe that firms that did grow established an effective internal organization and associated managerial skills, it is not clear that they maintained their performance throughout this process. In particular, when firms grow very fast, the challenges caused by the integration of new employees and the

adjustments made to the administration of the firm likely drag profitability down as managers have less time to dedicate to business development (**Penrose, 1959; Covin and Slevin, 1997**).

**When firms grow fast, managers face greater managerial complexity in the sense that the efforts required to coordinate tasks effectively is more challenging in a larger organization with increased interrelationships between resources (Covin and Slevin 1998). For instance, managers need to develop adequate control and information systems and face issues related to underdeveloped production devices and logistics. Adapting the firm's organization to solve these problems requires time, which means that when growth in employment is rapid fast, managers may not be able to successfully integrate the newly recruited employees. In such a context, the costs associated with growth in employment arguably exceeds the benefits of additional versatile workforce available, which means that performance can decline. In other words, when growth is rapid, managers don't have enough time to develop new capabilities and organize the firm's set of resources (Sirmon et al. 2007).**

This argument is in line with the recent work of Coad et al. (2020)<sup>3</sup> on the growth and survival of new ventures. Coad et al. (2020) showed that growth enhances the probability of survival for new ventures, but only for “moderate” levels of growth. New ventures that experience very fast growth have a lower likelihood of survival.

Taken together, our arguments suggest that profitability increases with growth in employment but only up to a certain threshold, after which profitability decreases. We thus propose the following:

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<sup>3</sup> Coad et al. (2020) considered growth in sales and not growth in employment.

Hypothesis 1. *There is a quadratic, inverse U-shaped relationship between growth in employment and profitability.*

#### **2.4. Moderating role of the strictness of LRPLs**

**Previous research has documented that LRPLs plays in important role in shaping the relationship between HR management and firm performance (Vanacker et al. 2017). However, whether LRPLs exert overall a positive or negative influence on firm performance is a widely debated question (Van Landuyt et al. 2017). With respect to the role of growth in employment, we propose that the strictness of LRPLs has a steepening moderating effect on firm performance. Because hypothesis 1 proposes that the relationship between employment growth and profitability is quadratic, with an inverse-U shape, the development of theoretical arguments about moderating effect should distinguish between the moderating effects at low levels of the independent variable and at high levels of the independent variable (Haans et al. 2016). We begin with our argument related to the moderating effect of LRPLs on the relationship between employment growth and performance at low levels of employment growth.**

**Firms recruit employees because they have current needs in terms of human capital (Penrose 1959). When firms recruit new employees, a crucial question for the newly recruited employees is whether the organization they join will be stable and safe in the future. Firms that recruit new employees show their willingness to grow and their ability to generate cash flows, because the increase in payrolls that follows the recruitment must be covered. For employees, this information suggests that their professional environment is, and will remain, stable and safe. Thus, employees' motivation to work and willingness to acquire new skills can be enhanced when firms hire new employees, which in turn increase firm's performance (Gust and Marquez 2004).**

Crucially, whether firms represent stable and safe working environments depends on the strictness of LRPLs (Cazes and Tonin 2010). In high LRPLs countries, recruiting new employees is binding because it is much more costly to dismiss employees. In other words, in high LRPLs countries, firms recruit if they have promising and realistic business opportunities. By contrast, the flexibility offered by low LRPLs means that firms can more easily take “risks” in hiring employees, because dismissing them in case of poor performance is easier and less costly (Damiani et al. 2016). For firms that have low or moderate growth in employment, being located in a country where LRPLs are strict will thus positively moderate the relationship between growth in employment and firm performance by ensuring that the workplace is safe and stable.

At high levels of employment growth, the moderating effect of the strictness of LRPL likely plays a different role. In building hypothesis 1, we argued that high levels of employment growth represent a destabilizing force because firms need to adapt their internal organization and HR management practices fast to integrate a large number of employees, which is extremely demanding for SMEs. In strict LRPLs countries, firms face strong administrative constraints, like the need to create dedicated committees on health and safety at work, rules about unionization, or collective dismissals procedures when thresholds on the number of employees are crossed (Botero et al. 2004). Rapidly growing firms cross these thresholds faster than less rapidly-growing firms, which means that the costs associated with each aspect of labor rights protection are cumulated fast. It follows, that the costs associated with internal reorganization and HR management resulting from rapid employment growth are higher in strict LRPLs countries.

In addition, the rapid accumulation of HR in fast growing firms means that the reallocation of the employees when the firm’s strategy changes is more difficult. It is well

**known that HR are “sticky” in the sense that it is difficult to assign employees to different missions and tasks (Mishina et al. 2004; Vanacker et al. 2017). For fast growing firms, the recruitment of employees leads to the accumulation of “slack” (or excess) resources (Penrose 1959). HR slack corresponds to HR that are not currently needed by firms, but will still consume managerial time, because managers need to organize the firm to absorb the corresponding employees. HR slack hampers firm performance because of its “sticky” nature, and is even more harmful in strict LRPLs countries, because strict LRPLs reduce managerial ability to reallocate HR slack. In other words, at high levels of employment growth, the strictness of LRPLs have a negative moderating effect on firm performance. Our theoretical arguments about the relationship between employment growth and firm performance and the moderating effects of LRPLs thus suggest that:**

**Hypothesis 2: *The relationship between employment growth and performance is steeper in countries with strict LRPLs than in countries with more flexible LRPLs.***

### **3. Methodology**

#### **3.1. Sample**

We used the Amadeus database, which is one of the databases provided by Bureau Van Dijk, as our first source of information. Amadeus provides access to accounting and financial information for privately held and publicly listed firms in Europe. We collected information for SMEs located in the following EU countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, the Netherlands, Portugal, Sweden, and Spain. These countries represent the historical core of the European Union. They thus have relatively homogenous institutions and developed bank-oriented economies. At the same time, these

countries are not identical in terms of labor rights protection<sup>4</sup> (Botero et al. 2004; von Below and Thoursie 2010), which means that our results are likely generalizable to other countries. In terms of size and economic importance, the countries we considered represent a population equivalent to that of the United States.

SMEs are defined according to the European Commission (European Commission 2020) criteria: Firms are considered SMEs if they have fewer than 250 employees and either their sales turnover is lower than 50M€ or their total assets is lower than 43M€. Furthermore, SMEs are standalone firms in the sense that they are not subsidiaries of a larger business group (BG). Indeed, firms affiliated with a BG have access to its internal capital and labor markets, which allows the transfer of financial resources and workers from one subsidiary to another. BGs are numerous in Europe, and up to fifty percent of all firms are affiliated with a BG in our context (Belenzon, Berkovitz, and Rios 2013). We excluded firms that operate in the finance industry.

Because Amadeus has a 10-year extraction limit, our dataset covered the years 2010 to 2019. Due to missing values on some variables, the final sample included 288,437 distinct SMEs and 1,233,272 firm-year observations. We present a breakdown of the observations by country in an additional document for the reviewers. As can be seen, Amadeus' coverage of European countries is highly heterogenous, which is largely explained by national reporting requirements, which greatly vary (Kalemli-Özcan et al. 2019). We acknowledge this limitation of our dataset.

Second, we used the Organization for Economic Co-operation and Development (OECD) database to obtain information for one important control variable: the LRPLs.

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<sup>4</sup> A notable difference is the role played by seniority rules in layoff procedures. While some of the countries we considered have such rules (France, Italy, or Sweden, for instance), it is not the case in all countries. See von Below and Thoursie (2010) for a detailed discussion.

Specifically, we employed the strictness of the employment protection index developed by the OECD, which evaluates the regulations on worker dismissals for regular contracts and the hiring of workers on temporary contracts for both collective and individual procedures.<sup>5</sup> Importantly, this index is calculated every year, which means changes in national LRPLs are taken into account over the considered period. The fact that our index was focused on contracts is important because it meant that our measure was homogenous across firms of different sizes. Indeed, it is relatively common that, in a given country, LRPLs are stricter for large firms than for small firms. Third, other country-level variables, such as GDP per capita and rule of law, which were used as control variables, were taken from the World Bank.

## 3.2. Variables

### 3.2.1. Dependent variables

Our key variable of interest in this study was firm performance. Specifically, we investigated the relationship between growth in employment and performance. Since we considered SMEs, we could not use market-based indicators of performance because most SMEs are not listed on public equity markets. Instead, we used accounting-based performance measures and focused on profitability. We defined firm profitability as the return on assets (ROA), calculated as operating income divided by total assets. However, it is important to recognize that profitability has two main components according to the Dupont equation, namely operating profit margin (operating income divided by sales) and asset turnover ratio (sales divided by total assets):

$$\begin{aligned}
 ROA &= \frac{\textit{Operating income}}{\textit{Total assets}} = \frac{\textit{Operating income}}{\textit{Sales}} * \frac{\textit{Sales}}{\textit{Total assets}} \\
 &= \textit{Operating profit margin} * \textit{Asset turnover ratio}
 \end{aligned}$$

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<sup>5</sup> Full documentation as well as the index itself are accessible at: <https://www.oecd.org/els/emp/oecdindicatorsofemploymentprotection.htm>

To gain further insights into the channel through which growth in employment influences profitability, we systematically ran our estimations over these three dependent variables.

### 3.2.2. Independent variable

Our independent variable throughout the empirical analysis was growth in employment, which was calculated as the annual percentage change in the number of permanent employees. We thus measure growth annually throughout the period 2010-2019 in our estimations.

### 3.2.3. Control variables

We included a broad set of time-varying control variables at the firm-, industry-, and country-level to limit the risk of omitted variables affecting our results. Specifically, we controlled for firm size (natural logarithm of total assets in K€), firm age (number of years since the firm's creation), growth in sales (annual percentage change in sales), financial leverage (short-term plus long-term financial debt divided by total assets), operating working capital (inventory plus receivables less payables divided by sales), cash holdings (cash and equivalents divided by total assets), and asset tangibility (tangible assets divided by total fixed assets). The inclusion of these firm-level controls was based on past theoretical predictions and empirical evidence on firm profitability. Indeed, young and small firms suffer from the liabilities of smallness and newness, which affect their performance and likelihood of survival (Aldrich and Auster 1986). Growth in sales is accompanied by economies of scale and scope, which increase profitability. Cash, working capital, and leverage are different forms of financial slack resources that play adaptive and stabilizing roles in organizations (Vanacker et al. 2017).

We also included two industry-level control variables, namely the mean-industry profitability ratio, calculated as annual country-industry-mean profitability based on the four-digit Nomenclature of Economic Activities (NACE), and the degree of industry competition, calculated as the Hirschman-Herfindahl index. Lastly, we included three country-level controls, namely the strength of LRPLs, GDP per capita, and rule of law. We used the OECD strictness of employment protection index to measure the strength of LRPLs in European countries. This index, which is compiled annually by the OECD, assesses the legal procedures on individual and collective dismissals as well as the hiring of workers. High values in the index correspond to strict LRPLs, while low values in the index correspond to more flexible LRPLs. Controlling for GDP per capita and rule of law is important for considering the influence of the economic vitality of a country and the quality of national governance on firm performance. Our choice of industry- and country-level variables followed the approach of Vanacker et al. (2017). It should be noted that all variables were winsorized at the first and last percentiles to mitigate the influence of outliers.

### **3.3. Econometric approach and endogeneity concerns**

We used firm- and year-fixed effects regressions<sup>6</sup> as our initial estimation method<sup>7</sup>. Doing so ensured that we considered the panel structure of our data and that unobserved time-invariant heterogeneity did not influence our results. In the regressions, we lagged the independent, moderating, and control variables by one year with respect to the dependent variable to help ensure the direction of causality. The standard errors were robust and clustered at the firm level. Since hypothesis 1 proposed a quadratic, inverse U-shaped relationship

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<sup>6</sup> In unreported estimations, we used instrumental variables as a robustness test. We obtained results similar to those of the fixed-effects model for two of our three dependent variables. We used the annual mean industry growth in employment and the annual mean regional growth in employment as instruments.

<sup>7</sup> We ran a Hausman test and the chi-squared statistics was 22,158.78 ( $p < 0.001$ ). We thus rejected the null hypothesis that the coefficients of the random-effects and fixed-effects models were the same and opt for a fixed-effects model.

between employment growth and profitability, we relied on Lind and Mehlum's (2010) three-step procedure as recommended in Haans et al. (2016). The three steps require the establishment of the existence of a quadratic, inverse U-shaped relation, as follows: (1) the squared term of the independent variable must be negative and statistically significant, (2) Sasabuchi's test must reject the joint null hypothesis that profitability does not increase (respectively decrease) faster at low (respectively high) levels of employment growth, and (3) the turning point must lie well within the data range as shown by the 95% Fieller confidence interval. We included all of the corresponding statistics at the bottom of the results tables.

However, as in any study that uses profitability as its dependent variable, the results of our estimations reflected a reverse-causality issue in the sense that firms that are already highly profitable typically decide to hire new employees. To lend greater credibility to our findings, we employed an alternative empirical approach with a propensity score matching (PSM) technique as a robustness test.

## **4. Results**

### **4.1. Univariate analysis**

We began the empirical analysis with descriptive statistics of our variables, as presented in Table 1 below. The average firm in our sample held 716K€ (median 657K€) of total assets and was 17.7 years old (median 16); as such, most of our sample firms were small but not young. The average operating margin was 4.0% (median 3.1%), the average asset turnover was 1.8 (median 1.4), and the average ROA was 5.6% (median 4.2%). The average employment growth rate was 8.8%, but the median was 0.0%, which indicates that most employment growth is driven by a relatively small set of rapidly growing firms. This observation is in line with past research on high-growth firms (Coad et al. 2014, 2017). The average firm held 15.3% of its

total assets as cash and equivalents, 24.7% of its total assets as working capital, and 22.3% of its total assets as financial debts.

**[Insert Table 1 around here]**

Next, we present a correlation matrix in Table 2. ROA was positively correlated with the asset turnover ratio and the operating margin, but the operating margin and the asset turnover ratio were negatively correlated. More importantly, ROA was positively correlated with employment growth but negatively correlated with the strictness of labor rights protection. The employment growth rate was negatively correlated with the strictness of labor rights protection. We calculated the variance inflation factors (VIFs) to determine the existence of a multicollinearity issue. The highest VIF was 2.57, and the mean VIF was 1.38. These figures were well below the commonly accepted threshold of 5, above which multicollinearity is a problem.

**[Insert Table 2 around here]**

#### **4.2. Multivariate analysis**

To test our hypothesis, we used firm- and year-fixed regressions. Table 3 below displays the results of the estimations. We employed three dependent variables, namely the operating margin (models 1 and 2), the asset turnover ratio (models 3 and 4), and the ROA (models 5 and 6). For each dependent variable, we presented the results of the models with and without the interaction term between employment and the labor rights protection index. With respect to hypothesis 1, models 1, 3, and 5 showed consistent results. The linear employment growth term was positive and statistically significant, and the squared employment growth term was negative and statistically significant. In models 1, 3, and 5, Sasabuchi's test rejected the joint null hypothesis. In models 1, 3, and 5, the turning point was well within the data range and was close to 100%. In other words, we observed a positive relationship between employment growth

and profitability, regardless of the dimension of profitability we considered. We thus found strong support for hypothesis 1. Importantly, the turning point was 86% for the operating margin, 109% for the asset turnover ratio, and 113% for ROA. In other words, the negative impact of employment growth, which we attributed to the challenges of integrating new employees and finding new organizational structures, were only visible for very rapidly growing firms: those firms that more than doubled their number of employees within one year. About 2% of our observations corresponded to an employment growth rate that was above the turning point. Figures 1, 2, and 3 below help visualize the results.

**[Insert Table 3 around here]**

**[Insert Figures 1, 2, and 3 around here]**

An important issue when investigating quadratic, inverse U-shaped relationships is the fact that the observed turning point may be an artifact of the existence of linear relationships of opposite signs between the dependent and independent variables in subsamples of the considered sample (Haans et al. 2016). In our case, the distribution and mean of our profitability variables were likely very different from one industry to another, which means that the turning point could have been different (assuming the turning point exists) depending on the considered industry. We thus ran our estimations on eight distinct subsamples, with each subsample including only firms that operated in a given one-digit NACE code. These subsamples were as follows: agriculture, mining, manufacturing, utilities, construction, transport, trade, and services. Table 4 below displays the results obtained with the asset turnover ratio as the dependent variable. As can be seen, the quadratic, inverse U-shaped relationship between employment growth and asset turnover ratio was confirmed in each industry. The turning point ranged from 0.84 (mining) to 0.93 (utilities), which indicates that the critical level of

employment growth above which profitability decreases was relatively homogenous across industries. We thus found strong empirical support for hypothesis 1.

**[Insert Table 4 around here]**

#### **4.3. Moderating role of LRPLs**

**With respect to hypothesis 2, we introduced interaction terms between the linear and squared terms of employment growth and the strength of LRPLs index. We presented the results of the estimations in Table 5. We observed no moderating effects of the strictness of labor rights protection when we use operating margin and profitability as dependent variables. However, the results obtained with the asset turnover ratio as dependent variable showed a steepening effect of the relationship between employment growth and the asset turnover ratio because the interaction term between squared employment growth and labor rights protection is negative and statistically significant (Haans et al. 2016). We thus find partial support for hypothesis 2. To help visualize the results, Figure 4 illustrates the relationship between employment growth and the asset turnover ratio for Italian firms (strict labor rights protection) and for Spanish firms (more flexible labor rights protection).**

**[Insert Table 5 around here]**

**[Insert Figure 4 around here]**

#### **4.4. Robustness tests**

The main issue with our previous empirical approach is that highly profitable firms could be those that decide to hire employees, which means that causality likely flows from profitability to employment growth and not the other way around. To address this issue, we decided to use a PSM technique, which is commonly considered as a reliable approach in non-experimental contexts (Dehejia and Wahba 2002), to assess the robustness of our results. The

rationale behind PSM is to compare the mean of an outcome variable between two groups of individuals: one group comprising treated individuals and a control group. The treated and control groups are created in such a way that individuals are matched based on their ex ante characteristics to be treated. Thus, treated and control individuals have the same propensity to be treated. In our context, the outcome was firm profitability and the treatment was the firm experiencing a strictly positive employment growth rate .

Specifically, we first ran a logistic regression model in which the dependent variable was a dummy variable that equaled one if a firm experienced a strictly positive employment growth rate in a given year. The dependent variable was regressed on the following variables: sales growth rate, cash holdings, size, financial leverage, operating working capital, asset tangibility, age, and sets of industry and country dummy variables. All of these variables have been defined previously in section 3.2. The results of the logit regression, which are presented in an additional document for the reviewers, confirmed that the independent variables were all statistically significant. For brevity, we only present the results for the year 2011, but the results were comparable for every year. We also present, in an additional document for the reviewers, the results of the balancing property test, which confirmed that both the mean and median bias were below the critical threshold of 5% and thus indicated a good balance of the variables between the treated and control groups. Then, the likelihood that a given firm would be treated was inferred from the residuals of the logistic regression. Next, firms that had a greater likelihood of being treated were matched and attributed to either the treated group (if they experienced strictly positive employment growth) or the control group (if they did not experience strictly positive employment growth but had ex ante the same likelihood of doing so).

Lastly, the average profitability of both groups during the next year was compared. Table 5 below presents the results for each year and for the three profitability measures. As can be seen, the asset turnover ratio and the ROA were statistically significantly higher in the treated group than in the control group each year. We did not observe this for the operating margin since it was occasionally higher in the control group and, sometimes, the difference was not statistically significant. At this stage, it is important to remember that we were not investigating a linear relationship but rather a quadratic, inverse U-shaped relationship between employment growth and profitability. To assess whether profitability declines for firms that experience a high-growth episode, we adjusted the PSM as follows. We ran a first-stage logistic regression in which the dependent variable was the likelihood of a firm experiencing a high-growth episode defined as an employment growth rate higher than 100%, which is the turning point we observed previously. Treated firms were then firms that experienced a high-growth episode, whereas control firms were those that experienced a lower growth rate. The results are displayed in Table 6 below. As can be seen, the asset turnover ratio was always statistically significantly lower in the treated group than in the control group, with the only exception being in the year 2013 (no statistically significant difference). For ROA and operating margin, we did not observe consistent results. The results depicted in Tables 6 and 7 lent additional support to hypothesis 1, at least for the asset turnover ratio.

**[Insert Tables 6 and 7 around here]**

## **5. Conclusion and discussion**

### **5.1. Discussion of the results**

Our main goal in this study was to examine how the pace of employment growth among SMEs influences their profitability. Building on theoretical arguments from the PTG, we predicted that SMEs that recruit new employees would experience an increase in profitability—

but only up to a certain level of growth, after which profitability would decline due to the challenges associated with new staff management and the constraints of internal re-organization. Using a large sample of European SMEs covering 13 countries, we found strong empirical support for our hypothesis. Employment growth was positively associated with profitability so long as the pace of annual growth was below 100%. Our results thus contribute to reconciling previously opposed theoretical views and empirical findings on the relationship between (high) growth and profitability (Markman and Gartner 2002; Davidsson et al. 2009; Coad et al. 2017).

Past research on growth and profitability has mostly focused on the impact of sales growth and profitability as driven by economies of scale (Porter 1980). Intuitively, there is no clear limit to the benefits of sales growth for profitability. In contrast, employment growth, the focus of this study, is challenging because it entails the acquisition of new resources that must be efficiently integrated, trained, and leveraged to generate future profits (Sirmon et al. 2007; Nason and Wiklund 2018). According to the PTG, the relationship between growth and profitability is a complex process, a complexity best captured when conceptualized as a two-stage process through which firms first acquire resources and only then experience stronger performance (Lefebvre 2023). Our work refined this view by explicitly incorporating the idea that firms cannot expand without limit because they are constrained by the availability of administrative competencies and managerial talent. As Penrose (1959, 44) noted, “the capacities of the existing managerial personnel of the firm necessarily set a limit to the expansion of the firm in any given period of time.” In fact, firms can expand faster than they can absorb resources, but doing so will result in organizational bottlenecks and difficulties that will reduce overall performance.

The challenges inherent to the resource-acquisition stage of growth are insufficiently considered when one examines the influence of sales growth on profitability. However, sales growth is often preceded by growth in employment (McKelvie and Wiklund 2010; Lefebvre 2023). The mixed findings on the relationship between growth and profitability generated in past research may thus be explained by the fact that the researchers did not explicitly integrate the speed at which new resources had been acquired (Belitski et al. 2023).

Two aspects of our results are especially interesting. First, the quadratic relationship between growth and profitability was observed in every industry. Growth has largely been considered as an industry-dependent phenomenon, with technological factors playing a major role (Colombelli, Krafft, and Quatraro 2014; Coad et al. 2014). The fact that growth can occur too quickly in any industry reflects more organizational (whether the firm's internal organization is adequate) and entrepreneurial (whether the entrepreneurs manage growth) contingencies than industry specificities (Dillen et al. 2019). In that sense, it seems useful to insist on the idea that to facilitate profitable growth, public policies should not excessively focus on a particular sector (like high-tech firms). Second, the maximum annual growth rate above which a marginal increase does not bring additional profitability is remarkably homogenous across industries and is close to 100%. Here again, there seems to be a natural limit on how quickly growth can occur and still be efficiently incorporated, and this limit does not depend on industry considerations. This observation is somewhat surprising because the role of HR is obviously not the same in every industry.

**Our work thus contributes to bring more clarity to the discussion of the benefits and limitations associated with SMEs growth, which are somewhat loose. On one side, growth is viewed as a desired outcome for SMEs and is associated with entrepreneurial success and increased profits (Penrose, 1959; McKelvie and Wiklund 2010). On the other**

**side, growth is highly challenging for SMEs in terms of organization adaptation, recruitment, and management and “relatively few SMEs manage to grow successfully” (Kindström, Carlborg and Nord 2022, p. 2). Our results showed that the vast majority of SMEs experience employment growth rates that are compatible with increased profits. Thus, growth is rather successfully achieved by most SMEs, an observation that challenges previous observations (Markman and Gartner 2002; Kindström et al. 2022). At the same time, we identified explicitly the fraction of the SMEs population for which growth becomes excessive. We thus brought important empirical evidence about the thresholds above which the costs associated with the growth process exceed the benefits obtained with larger resources.**

Our results have valuable implications for entrepreneurs, SME managers, and public policies. By showing that growth beyond a certain level is detrimental to firm performance, we offer a useful demonstration of the need to structure growth through time and gradually recruit employees to ensure that firms successfully integrate these new employees. By contrast, employment growth beyond the 100% level seems “out-of-control.” Public policies, just like entrepreneurs, should be aware that fast growth can be more of a problem than a solution. The excessive focus of public policies on high growth has been highlighted in the past (Brown et al. 2017). However, no empirical evidence was generated on the level at which growth becomes detrimental for firm performance, a practical gap our paper filled.

**We further investigated the moderating role of labor rights protection in the relation between growth and profitability. The role of labor rights protection has received considerable academic attention with opposed theoretical views about the costs and benefits associated with the strictness of LRPLs in terms of firm performance (Van Landuyt et al. 2017). We only obtained partial support for our hypothesis 2 about the**

**moderating role of LRPLs. Still, our results pointed out a double-edged sword effect of the role of LRPLs, as the moderating effect of LRPLs is positive at relatively low levels of employment growth and becomes negative for fast-growing firms. This observation is useful for public policy-makers as it indicates that LRPLs act as a friction on labor markets in the case of rapid-growth episodes, but has beneficial effects for firms that grow steadily.**

## **5.2. Limitations and directions for future research**

As with any research, our study had limitations. First, we could not qualitatively measure which functions newly recruited employees perform. When studying the growth of firms, it is essential to recognize that hiring new employees serves distinct purposes: increasing the workforce to perform operating tasks (selling, marketing, and production) and developing the managerial team to enhance administrative functions. **This distinction is important because it is directly associated to the strategy the firm implements, which is an important moderating factor of the relationship between employment growth and profitability (Senderovitz et al. 2016).** As a limitation of our dataset, we were not able to distinguish between both categories of recruitment. Future research could fruitfully examine how SMEs structure their recruitment process to cope with the need to hire managers and an operating workforce at the same time.

We were also unable to distinguish between acquisitive growth and organic growth. This point is important both conceptually and empirically (Lockett et al. 2011). Indeed, acquiring HR through the acquisition of another company means that it is possible to immediately obtain the managerial and administrative resources needed for integration. At the same time, combining the new resources obtained via acquisition with existing resources is challenging (Wiklund and Shepherd 2009). It would be interesting to determine whether the

mode of growth (acquisitive versus organic) influences the relationship between growth and profitability. We hope our work will contribute to stimulating research in this area.

## References

Achtenhagen, L., L. Naldi, and L. Melin. 2010. "Business Growth" – Do Practitioners and Scholars Really Talk about the Same Thing?" *Entrepreneurship Theory and Practice* 34 (2): 289-316.

Aldrich, H. E. and E. R. Auster. 1986. "Even Dwarfs Started Small: Liabilities of Age and Size and Their Strategic Implications." *Research in Organizational Behavior* 8: 165-98.

**Alvarez, S.A., and J.B. Barney. 2005. "How do entrepreneurs organize firms under conditions of uncertainty?" *Journal of Management* 31 (5): 776-793.**

Autor, D. H., W. R. Kerr, and A. D. Kugler. 2007. "Does Employment Protection Reduce Productivity? Evidence from US States." *Economic Journal* 117 (521): 211-31.

Barney, J. B. 1991. "Firm Resources and Sustained Competitive Advantage." *Journal of Management* 17 (1): 99-120.

Barney, J. B. and P. M. Wright. 1998. "On Becoming a Strategic Partner: The Role of Human Resources in Gaining Competitive Advantage." *Human Resource Management* 37 (1): 31-46.

Bauernschuster, S. 2013. "Dismissal Protection and Small Firms Hirings: Evidence from a Policy Reform." *Small Business Economics* 40: 293-307.

Belenzon, S., T. Berkovitz, and L. A. Rios. 2013. "Capital Markets and Firm Organization: How Financial Development Shapes European Corporate Groups." *Management Science* 59 (6): 1326-43.

Belitski, M., T. Stettler, W. Wales, and J. Martin. 2023. "Speed and Scaling: An Investigation of Accelerated Firm Growth." *Journal of Management Studies* 60 (3): 639-87.

Ben-Hafaïedh, C. and A. Hamelin. 2023. "Questioning the Growth Dogma: A Replication Study." *Entrepreneurship Theory and Practice* 47 (2): 628-47.

Birch, D. L. and J. Medoff. 1994. "Gazelles." In *Labor, Markets, Employment Policy and Job Creation*, edited by L. C. Solmon and A. R. Levenson, 159-67. Boulder, CO and London, UK: Westview Press.

Botero, J. C., S. Djankov, R. La Porta, F. Lopez-de-Silanes, and A. Shleifer. 2004. "The Regulation of Labor." *Quarterly Journal of Economics* 119 (4): 1339-82.

Brown, R., S. Mawson, and C. Mason. 2017. "Myth-busting and Entrepreneurship Policy: The Case of High-growth Firms." *Entrepreneurship and Regional Development* 29 (5-6): 414-43.

Brush, T. H., P. Bromiley, and M. Hendrickx. 2000. "The Free Cash-flow Hypothesis for Sales Growth and Firm Performance." *Strategic Management Journal* 21 (4): 455-72.

Cassia, L. and T. Minola. 2012. "Hyper-growth of SMEs: Toward a Reconciliation of Entrepreneurial Orientation and Strategic Resources." *International Journal of Entrepreneurial Behaviour & Research* 18 (2): 179-97.

**Cazes, S., and T. Monin. 2010. "Employment protection legislation and job stability: A European cross-country analysis." *International Labour Review* 149 (3): 261-285.**

Chandler, G. N., A. McKelvie, and P. Davidsson. 2009. "Asset Specificity and Behavioral Uncertainty as Moderators of the Sales Growth-Employment Growth Relationship in Emerging Ventures." *Journal of Business Venturing* 24 (4): 373-87.

Coad, A., M. Cowling, and J. Siepel. 2017. "Growth Processes of High-growth Firms as a Four-dimensional Chicken and Egg." *Industrial and Corporate Change* 26 (4): 537-54.

Coad, A., S.-O. Daunfeldt, D. Johansson, and K. Wennberg. 2014. "Whom Do High-growth Firms Hire?" *Industrial and Corporate Change* 23 (1): 293-327.

Coad, A., J. L. Frankish, and D. J. Storey. 2020. "Too Fast to Live? Effects of Growth on Survival across the Growth Distribution." *Journal of Small Business Management* 58 (3): 544-71.

Colombelli, A., J. Krafft, and F. Quatraro. 2014. "High-growth Firms and Technological Knowledge: Do Gazelles Follow Exploration or Exploitation Strategies?" *Industrial and Corporate Change* 23 (1): 261-91.

**Covin, J.G., & D.P. Slevin. 1997. "High growth transitions: theoretical perspectives and suggested directions." In Entrepreneurship 2000, Sexton, D.L., Smilor, R.W. (eds). Upstart, Chicago, 99-126.**

**Covin, J.G., & D.P. Slevin. 1998. "Time, growth, complexity, and transitions: Entrepreneurial challenges for the future." Entrepreneurship Theory and Practice 22(2): 53-68.**

**Damiani, M., F. Pompei, and A. Ricci. 2016. "Temporary employment protection and productivity growth in EU economies." International Labour Review 155 (4): 587-622.**

Daunfeldt, S. O., N. Elert, and D. Johansson. 2014. "The Economic Contribution of High-growth Firms: Do Policy Implications Depend on the Choice of the Growth Indicator?" *Journal of Industry, Competition, and Trade* 14: 337-65.

Davidsson, P., P. Steffens, and J. Fitzsimmons. 2009. "Growing Profitable or Growing from the Profits: Putting the Horse in Front of the Cart?" *Journal of Business Venturing* 24 (4): 388-406.

Dehejia, R. H. and S. Wahba. 2002. "Propensity Score-matching Methods for Nonexperimental Causal Studies." *Review of Economics and Statistics* 84 (1): 151-61.

**Demir, R., K. Wennberg, and A. McKelvie. 2017. "The strategic management of high-growth firms: A review and theoretical conceptualization." *Long Range Planning* 50: 431-456.**

Dillen, Y., E. Laveren, R. Martens, S. De Vocht, and E. Van Imschoot. 2019. "From 'Manager' to 'Strategist': An Examination of the Evolving Role of Persistent High-growth Entrepreneurs." *International Journal of Entrepreneurial Behaviour & Research* 25 (1): 2-28.

Erhardt, E. C. 2021. "Measuring the Persistence of High Firm Growth: Choices and Consequences." *Small Business Economics* 56: 451-78.

European Commission. 2020. User Guide to SME Definition. <https://ec.europa.eu/docsroom/documents/42921>

Flamholtz, E. and Y. Randle. 2000. *Growing Pains*. San Francisco: Jossey Bass.

Furlan, A., R. Grandinetti, and A. Paggiaro. 2014. "Unveiling the Growth Process: Entrepreneurial Growth and the Use of External Resources." *International Journal of Entrepreneurial Behaviour & Research* 20 (1): 20-41.

Gartner, W. B. 1997. "When Growth Is the Problem, Not the Solution." *Journal of Management Inquiry* 6 (1): 62-8.

Greiner, L. E. 1972. "Evolution and Revolution as Organizations Grow." *Harvard Business Review* 50: 37-46.

Grillitsch, M. and T. Schubert. 2021. "Does the Timing of Integrating New Skills Affect Start-up Growth?" *Strategic Entrepreneurship Journal* 15 (4): 647-84.

Gust, C. and J. Marquez. 2004. "International Comparisons of Productivity Growth: The Role of Information Technology and Regulatory Practices." *Labour Economics* 11 (1): 33-58.

Haans, R. F., C. Pieters, and Z.-L. He. 2016. "Thinking about U: Theorizing and Testing U- and Inverted U-shaped Relationships in Strategic Management Research." *Strategic Management Journal* 37 (7): 1177-95.

Hatch, N. W. and J. H. Dyer. 2004. "Human Capital and Learning as a Source of Sustainable Competitive Advantage." *Strategic Management Journal* 25 (12): 1155-78.

Helfat, C. E. and M. A. Peteraf. 2003. "The Dynamic Resource-based View: Capability Lifecycle." *Strategic Management Journal* 24 (10): 997-1010.

Jovanovic, B. 1982. "Evolution and the Evolution of Industry." *Econometrica* 50: 649-70.

Kalemli-Özcan, S., B. Sorensen, C. Villegas-Sanchez, V. Volosovych, and S. Yesiltas. 2019. "How to Construct Nationally Representative Firm Level Data from the Orbis Global Database: New Facts and Aggregate Implications." *NBER Working Paper 21558*. doi: 10.3386/w21558.

**Kindström, D., P. Carlborg, and T. Nord. 2022 (forthcoming). "Challenges for growing SMEs: A managerial perspective." *Journal of Small Business Management*. DOI: 10.1080/00472778.2022.2082456**

Kuratko, D. F., H. L. Holt, and E. Neubert. 2020. "Blitzscaling: The Good, the Bad, and the Ugly." *Business Horizons* 63 (1): 109-19.

Lai, Y., G. Saridakis, and S. Johnstone. 2017. "Human Resources Practices, Employee Attitude, and Small Firm Performance." *International Small Business Journal* 35 (4): 470-94.

Lefebvre, V. 2023. "The Growth Process of IPO Firms." *Journal of Business Venturing Insights* 19: e00377.

- Li, M., S. J. Goetz, M. Partridge, and D. A. Fleming. 2016. "Location Determinants of High-growth Firms." *Entrepreneurship and Regional Development* 28 (1-2): 97-125.
- Lind, J. T. and H. Mehlum. 2010. "With or Without U? The Appropriate Test for a U-shaped Relationship." *Oxford Bulletin of Economics and Statistics* 72 (1): 109-18.
- Lockett, A., J. Wiklund, P. Davidsson, and S. Girma. 2011. "Organic and Acquisitive Growth: Re-examining, Testing, and Extending Penrose's Growth Theory." *Journal of Management Studies* 48 (1): 48-74.
- McKelvie, A. and J. Wiklund. 2010. "Advancing Firm Growth Research: A Focus on Growth Mode Instead of Growth Rate." *Entrepreneurship Theory and Practice* 34 (2): 261-88.
- Markman, G. and W. B. Gartner. 2002. "Is Extraordinary Growth Profitable? A Study of Inc. 500 High-growth Companies." *Entrepreneurship Theory and Practice* 27 (1): 65-75.
- Mishina, Y., T. G. Pollock, and J. F. Porac. 2004. "Are More Resources Always Better for Growth? Resource Stickiness in Market and Product Expansion." *Strategic Management Journal* 25 (12): 1179-97.
- Moran, P. and S. Ghoshal. 1999. "Markets, Firms, and the Process of Economic Development." *Academy of Management Review* 24 (3): 390-412.
- Moreno, A. M. and J. C. Casillas. 2007. "High-growth SMEs versus Non-high-growth SMEs: A Discriminant Analysis." *Entrepreneurship and Regional Development* 19 (1): 69-88.
- Nason, R. S. and J. Wiklund. 2018. "An Assessment of Resource-based Theorizing on Firm Growth and Suggestions for the Future." *Journal of Management* 44 (1): 32-60.
- Nicholls-Nixon, C.L. 2005. "Rapid growth and high performance: The entrepreneur's "impossible" dream?" *Academy of Management Executive* 19 (1): 77-89.

Penrose, E. T. 1959. *The Theory of the Growth of the Firm*. New York: Oxford University Press.

Pitelis, C. N. 2007. "A Behavioral Resource-based View of the Firm: The Synergy of Cyert and March (1963) and Penrose (1959)." *Organization Science* 18 (3): 478-90.

Ployhart, R. E., C. H. Van Iddekinge, and W. I. Mackenzie. 2011. "Acquiring and Developing Human Capital in Services Contexts: The Interconnectedness of Human Capital Resources." *Academy of Management Journal* 54 (2): 353-68.

Porter, M. E. 1980. "Industry Structure and Competitive Strategy: Keys to Profitability." *Financial Analysts Journal* 36 (4): 30-41.

Shepherd, D. A. and J. Wiklund. 2009. "Are We Comparing Apple with Apple or Apple with Oranges? Appropriateness of Knowledge Accumulation in Growth Studies." *Entrepreneurship Theory and Practice* 33 (1): 105-23.

**Senderovitz, M., K. Klyver, and P. Steffens. 2016. "Four years on: are the gazelles still running? A longitudinal study of firm performance after a period of rapid growth." *International Small Business Journal* 34: 391-411.**

Sirmon, D. G. and M. A. Hitt. 2003. "Managing Resources: Linking Unique Resources, Management, and Wealth Creation in Family Firms." *Entrepreneurship Theory and Practice* 27 (4): 339-58.

Sirmon, D. G., M. A. Hitt, and R. D. Ireland. 2007. "Managing Firm Resources in Dynamic Environments to Create Value: Looking Inside the Black Box." *Academy of Management Review* 32 (1): 273-92.

- Slevin, D. P. and J. G. Covin. 1998. "Time, Growth, Complexity, and Transitions: Entrepreneurial Challenges for the Future." *Entrepreneurship Theory and Practice* 22 (2): 53-68.
- Storey, D. J., G. Saridakis, S. Sen Gupta, P. K. Edwards, and R. A. Blackburn. 2010. "Linking HR Formality with Employee Job Quality: The Role of Firm and Workplace Size." *Human Resource Management* 49 (2): 305-29.
- Vanacker, T., V. Collewaert, and S. Zahra. 2017. "Slack Resources, Firm Performance, and the Institutional Context: Evidence from Privately Held Firms." *Strategic Management Journal* 38 (6): 1305-26.
- Van Landuyt, Y., N. Dewaelheyns, and C. Van Hulle. 2017. "Employment Protection Legislation and SME Performance." *International Small Business Journal* 35 (3): 306-26.
- Von Below, D. and P. S. Thoursie. 2010. "Last In, First Out?: Estimating the Effect of Seniority Rules in Sweden." *Labour Economics* 17 (6): 987-97.
- Wernerfelt, B. 1984. "A Resource-based View of the Firm." *Strategic Management Journal* 5 (2): 171-80.
- Wiklund, J. and D. Shepherd. 2003. "Aspiring for, and Achieving Growth: The Moderating Role of Resources and Opportunities." *Journal of Management Studies* 40 (8): 1919-41.
- Wiklund, J. and D. Shepherd. 2009. "The Effectiveness of Alliances and Acquisitions: The Role of Resource Combination Activities." *Entrepreneurship Theory and Practice* 33 (1): 193-212.
- Wright, P. M., B. B. Dunford, and S. A. Snell. 2001. "Human Resources and the Resource-based View of the Firm." *Journal of Management* 27 (6): 701-21.

Figure 1. Relationship between employment growth and operating margin

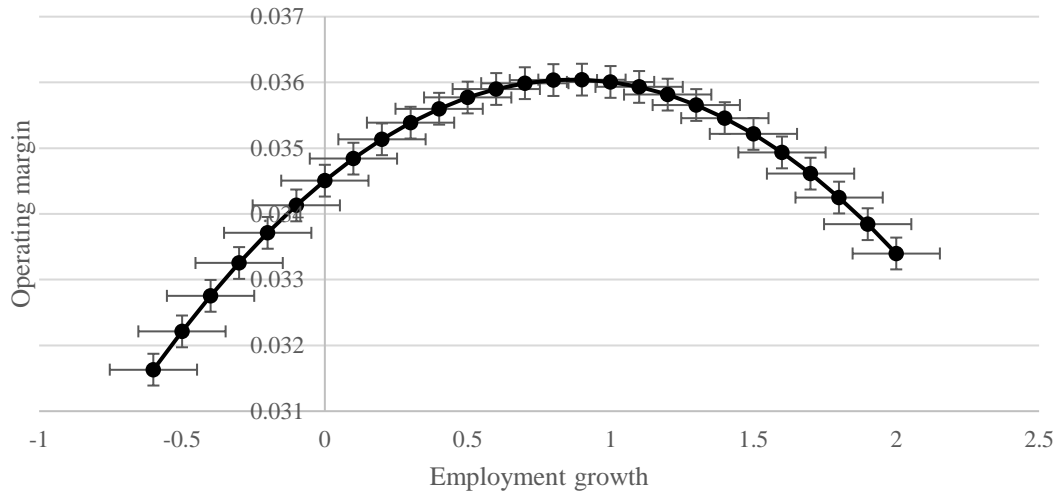


Figure 2. Relationship between employment growth and asset turnover

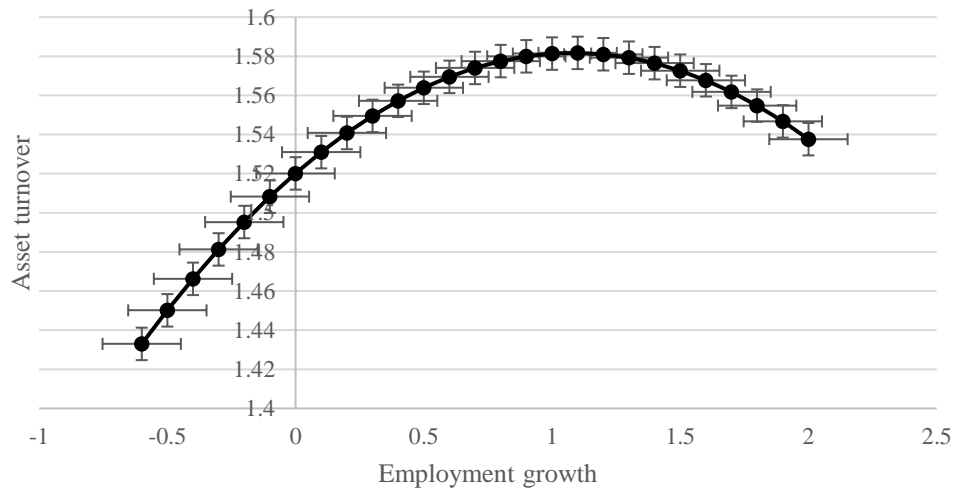


Figure 3. Relationship between employment growth and profitability (ROA)

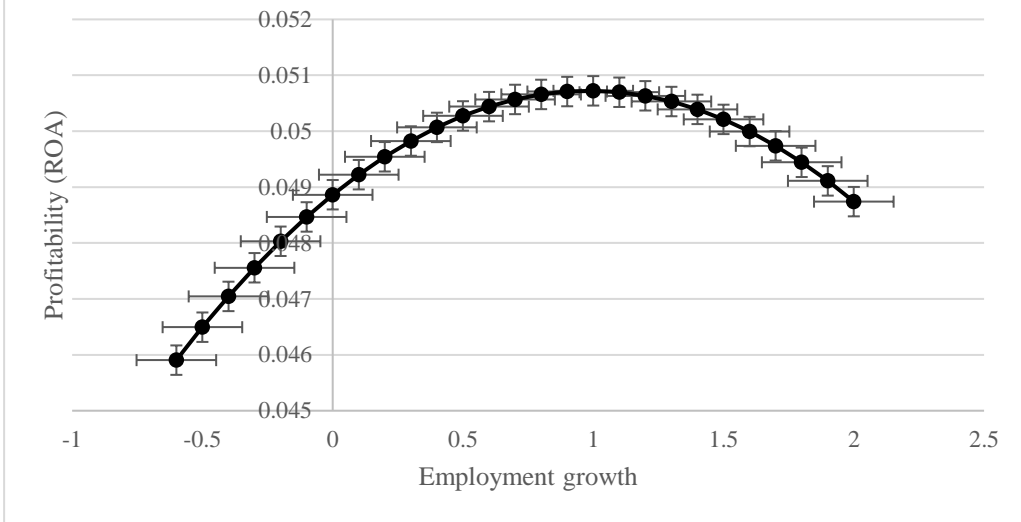


Figure 4. Relationship between employment growth and profitability

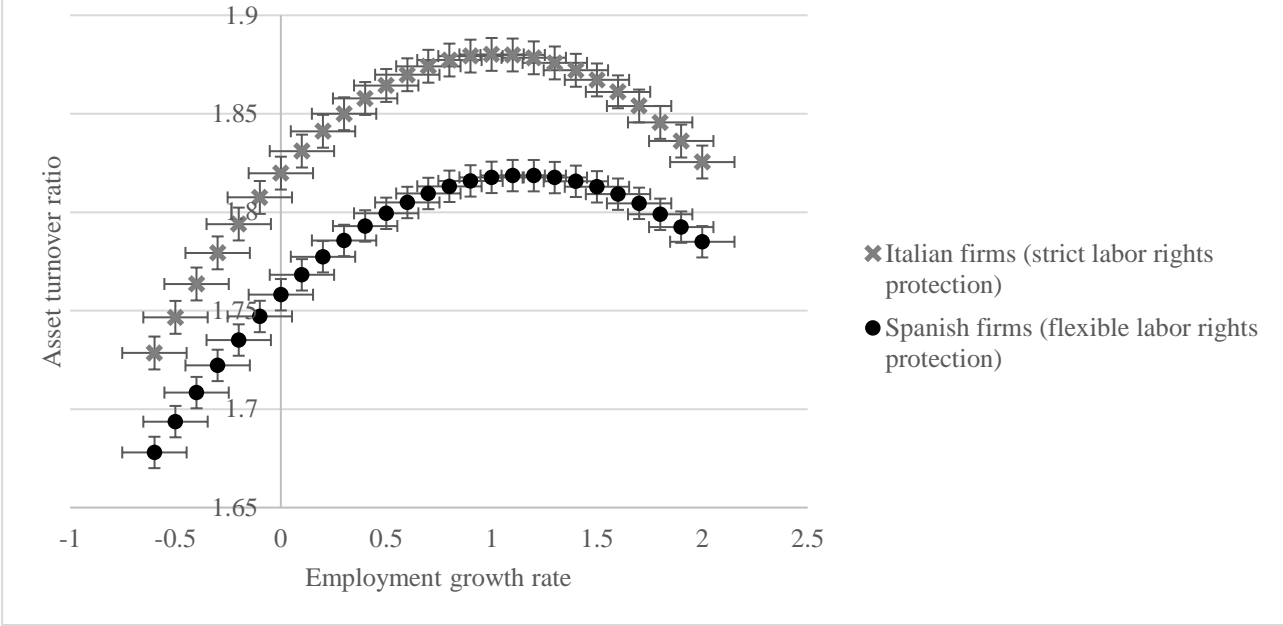


Table 1. Descriptive statistics

Variables	Mean	Standard deviation	Minimum	25th percentile	Median	75th percentile	Maximum
Operating margin	0.040	0.148	-0.464	0.009	0.031	0.075	0.466
Asset turnover	1.752	1.462	0.077	0.838	1.376	2.193	7.878
Profitability (ROA)	0.056	0.141	-0.429	0.012	0.042	0.100	0.486
Employment growth rate	0.088	0.392	-0.600	0.000	0.000	0.111	2.000
Squared employment growth rate	0.161	0.694	0.000	0.000	0.003	0.049	4.000
Labor rights protection index	2.379	0.433	1.964	1.964	2.450	2.496	3.392
Sales growth rate	0.194	0.887	-0.598	-0.065	0.039	0.182	4.867
Size (log)	6.574	1.450	3.466	5.537	6.488	7.594	9.968
Age	17.708	12.358	1.000	8.000	16.000	24.000	62.000
Financial leverage	0.223	0.227	0.000	0.025	0.162	0.354	0.950
Cash holdings	0.153	0.174	0.000	0.025	0.088	0.223	0.756
Operating working capital	0.247	0.412	-0.289	0.038	0.146	0.314	2.545
Asset tangibility	0.789	0.304	0.000	0.680	0.956	1.000	1.000
Mean industry operating margin	0.036	0.035	-0.036	0.016	0.032	0.051	0.151
Mean industry asset turnover ratio	1.973	0.696	0.621	1.534	1.834	2.288	4.169
Mean industry profitability (ROA)	0.061	0.035	-0.010	0.039	0.056	0.075	0.176
Industry competition	0.005	0.004	0.001	0.002	0.004	0.007	0.017
Rule of law	1.118	0.487	0.269	0.968	1.032	1.399	2.050
GDP per capita (log)	10.396	0.293	9.865	10.244	10.317	10.563	11.021

N=1,233,272 for all variables except for Operating margin (N=1,214,885), ROA (N=1,215,148), Employment growth rate and Squared employment growth rate (N=1,169,562).

Table 2. Correlation matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Operating margin																	
2 Asset turnover	-0.073																
3 Profitability (ROA)	0.633	0.053															
4 Employment growth rate	0.014	0.057	0.036														
5 Labor rights protection index	-0.008	0.002	-0.008	-0.036													
6 Sales growth rate	0.005	0.053	0.037	0.331	0.001												
7 Size	0.052	-0.364	-0.024	-0.025	-0.031	-0.033											
8 Age	-0.004	-0.178	-0.065	-0.137	0.067	-0.137	0.387										
9 Financial leverage	-0.050	-0.077	-0.094	0.016	-0.066	0.018	-0.021	-0.081									
10 Cash holdings	0.104	0.151	0.174	0.011	0.020	0.021	-0.228	-0.072	-0.303								
11 Operating working capital	0.013	-0.009	0.002	0.005	0.074	-0.019	-0.052	0.023	0.093	-0.023							
12 Asset tangibility	-0.055	-0.308	-0.090	-0.046	-0.015	-0.026	0.193	0.122	0.070	-0.225	-0.027						
13 Mean industry operating margin	0.153	-0.127	0.118	0.020	-0.026	0.020	0.007	-0.011	-0.076	0.094	-0.052	-0.001					
14 Mean industry asset turnover ratio	-0.066	0.430	-0.001	0.021	0.003	0.010	-0.240	-0.117	-0.005	0.115	-0.041	-0.210	-0.275				
15 Mean industry profitability (ROA)	0.121	-0.036	0.146	0.033	-0.033	0.032	-0.078	-0.068	-0.122	0.156	-0.095	-0.034	0.817	-0.045			
16 Industry competition	0.021	-0.112	0.005	-0.008	0.028	-0.009	0.253	0.123	-0.040	-0.051	-0.025	0.062	0.029	-0.303	-0.030		
17 Rule of law	0.017	0.134	0.065	-0.032	-0.076	-0.014	-0.474	-0.150	0.018	0.162	0.018	-0.097	0.075	0.031	0.110	-0.187	
18 GDP per capita (log)	0.045	0.150	0.106	-0.034	-0.118	-0.028	-0.041	-0.010	-0.106	0.102	-0.069	-0.164	0.092	-0.027	0.125	-0.027	0.599

N=1,169,341. Correlation coefficients higher than 0.003 in absolute value are statistically significant at the 0.05 level.

Table 3. Firm- and year-fixed effects regressions of the relation between performance and growth

Dependent variable	Operating margin			Asset turnover			Profitability (ROA)		
	Coef.		St. Error	Coef.		St. Error	Coef.		St. Error
Lagged employment growth rate	0.004	***	0.001	0.114	***	0.003	0.004	***	0.001
Lagged squared employment growth rate	-0.002	***	0.000	-0.052	***	0.002	-0.002	***	0.000
Lagged sales growth rate	0.005	***	0.000	0.047	***	0.002	0.004	***	0.000
Lagged size	-0.023	***	0.001	-0.338	***	0.005	-0.042	***	0.001
Lagged age	0.004	***	0.000	0.013	***	0.002	0.006	***	0.000
Lagged financial leverage	0.040	***	0.002	-0.157	***	0.010	0.048	***	0.002
Lagged cash holdings	0.007	***	0.002	-0.090	***	0.012	0.018	***	0.002
Lagged operating working capital	-0.023	***	0.002	0.074	***	0.007	-0.015	***	0.001
Lagged asset tangibility	-0.007	***	0.001	0.266	***	0.023	-0.006	***	0.001
Strength of labor rights protection	0.008	***	0.001	0.086	***	0.009	0.007	***	0.001
Rule of law	-0.011	***	0.004	-0.084	***	0.004	-0.001	***	0.004
GDP per capita	0.145	***	0.007	0.554	***	0.039	0.221	***	0.007
Constant	-1.400	***	0.065	-2.545	***	0.387	-2.104	***	0.066
Number of observations	1,215,885			1,233,272			1,215,148		
Firm- and year-fixed effects	YES			YES			YES		
R-squared	0.579			0.892			0.551		
F statistics	352.68 ***			540.96 ***			549.27 ***		
Turning point (employment growth rate)	0.865			1.083			0.984		
Sasabuchi's test statistics	4.38 ***			19.41 ***			4.19 ***		
95% Fieller confidence interval	0.674	1.126		1.036	1.136		0.793	1.280	

Standard errors are robust and clustered at the firm level. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 4. Breakdown of the results by industry

Asset turnover is the dependent variable	Agriculture, forestry, and fishing		Mining		Manufacturing	
	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error
Lagged employment growth rate	0.048 ***	0.007	0.064 **	0.027	0.092 ***	0.005
Lagged squared employment growth rate	-0.020 ***	0.005	-0.040 **	0.016	-0.043 ***	0.004
Lagged sales growth rate	0.024 ***	0.004	0.047 ***	0.010	0.043 ***	0.003
Lagged size	-0.240 ***	0.020	-0.091 **	0.038	-0.287 ***	0.009
Lagged age	0.006 *	0.004	-0.013	0.017	0.021 ***	0.005
Lagged financial leverage	-0.037	0.032	-0.035	0.079	-0.172 ***	0.015
Lagged cash holdings	-0.138 ***	0.042	-0.244 ***	0.086	-0.163 ***	0.018
Lagged operating working capital	-0.021 ***	0.006	-0.049 ***	0.018	-0.114 ***	0.008
Lagged asset tangibility	-0.004	0.036	0.073	0.053	0.035 ***	0.011
Lagged mean industry-level dependent variable	0.067	0.044	0.023	0.091	0.233 ***	0.021
Lagged industry competition	0.971	4.559	-0.814	9.491	-1.862	1.461
Strength of labor rights protection	0.011	0.029	0.026	0.044	0.042 ***	0.010
Rule of law	-0.009	0.041	0.238 **	0.106	0.008	0.025
GDP per capita	0.278 ***	0.093	0.272	0.334	0.833 ***	0.092
Constant	-0.452	0.947	-1.439	3.427	-6.006 ***	0.938
Number of observations	56,576		4,160		264,643	
Firm- and year-fixed effects	YES		YES		YES	
R-squared	0.900		0.842		0.885	
F statistics	18.090 ***		6.100 ***		146.180 ***	
Turning point	1.201		0.796		1.056	
Sasabuchi's test statistics	2.760 ***		2.220 **		8.880 ***	
95% Fieller confidence interval	0.933	1.808	0.294	1.700	0.956	1.182

Standard errors are robust and clustered at the firm level. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.1 levels, respectively. N/A stands for “not applicable” and refers to cases where the Lind and Mehlum (2010) procedure fails to produce an output.

Table 4. (continued)

Utilities		Construction		Transport	
Coef.	St. Error	Coef.	St. Error	Coef.	St. Error
0.075 ***	0.024	0.140 ***	0.008	0.084 ***	0.010
-0.043 ***	0.015	-0.047 ***	0.005	-0.045 ***	0.006
0.044 ***	0.012	0.025 ***	0.003	0.053 ***	0.006
-0.155 ***	0.042	-0.178 ***	0.012	-0.222 ***	0.015
0.006	0.009	0.010 ***	0.004	0.005	0.003
-0.271 ***	0.066	-0.246 ***	0.026	-0.126 ***	0.033
-0.080	0.085	-0.106 ***	0.025	-0.359 ***	0.036
-0.072 ***	0.018	-0.005	0.008	-0.173 ***	0.018
0.061	0.061	0.072 ***	0.016	0.000	0.027
0.010	0.049	0.132 ***	0.043	-0.016	0.051
1.125	5.944	2.488	4.032	-0.605	5.325
0.085 *	0.047	0.024	0.024	-0.016	0.027
-0.090	0.097	0.134 ***	0.047	0.044	0.054
-0.091	0.353	1.474 ***	0.133	0.218	0.166
3.259	3.699	-13.345 ***	1.338	0.876	1.700
	11,900		164,022		83,187
	YES		YES		YES
	0.931		0.865		0.871
8.170 ***		81.040 ***		44.620 ***	
	0.878		1.495		0.935
2.410 ***		4.540 ***		5.910 ***	
0.515	1.693	1.304	1.779	0.789	1.126

Table 4. (continued)

Trade		Services	
Coef.	St. Error	Coef.	St. Error
0.095 ***	0.006	0.137 ***	0.007
-0.052 ***	0.004	-0.063 ***	0.004
0.077 ***	0.004	0.040 ***	0.003
-0.349 ***	0.011	-0.483 ***	0.012
0.011 ***	0.004	0.032 ***	0.003
-0.229 ***	0.019	-0.050 **	0.024
-0.048 *	0.025	-0.012	0.025
-0.213 ***	0.010	-0.031 ***	0.010
0.063 ***	0.013	0.116 ***	0.016
0.279 ***	0.029	0.282 ***	0.028
-0.082	2.654	-2.520	2.104
0.044 ***	0.016	0.000	0.024
0.089 ***	0.034	0.200 ***	0.047
0.567 ***	0.111	0.610 ***	0.088
-2.375 **	1.122	-2.841 ***	0.887
387,952		260,832	
YES		YES	
0.914		0.892	
153.080 ***		141.770 ***	
0.906		1.088	
11.290 ***		10.860 ***	
0.829 0.995		1.006 1.185	

Table 5. Moderating role of the strength of LRPLs

Dependent variable	Operating margin		Asset turnover		Profitability	
	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error
Lagged employment growth rate	0.006	0.004	0.075 ***	0.016	0.007 **	0.003
Lagged squared employment growth rate	-0.002	0.002	-0.018	0.011	-0.003	0.002
Strength of labor rights protection	0.006 ***	0.001	0.079 ***	0.009	0.003 **	0.001
Lagged employment growth rate * Strength of labor rights protection	-0.001	0.002	0.015 **	0.007	-0.001	0.001
Lagged squared employment growth * Strength of labor rights protection	0.000	0.001	-0.014 ***	0.005	0.001	0.001
Lagged sales growth rate	0.005 ***	0.000	0.047 ***	0.002	0.004 ***	0.000
Lagged size	-0.023 ***	0.001	-0.332 ***	0.005	-0.042 ***	0.001
Lagged age	0.004 ***	0.000	0.016 ***	0.001	0.006 ***	0.000
Lagged financial leverage	0.041 ***	0.002	-0.152 ***	0.010	0.049 ***	0.002
Lagged cash holdings	0.006 ***	0.002	-0.092 ***	0.012	0.016 ***	0.002
Lagged operating working capital	-0.023 ***	0.002	-0.080 ***	0.004	-0.015 ***	0.001
Lagged assets tangibility	-0.007 ***	0.001	0.075 ***	0.007	-0.005 ***	0.001
Lagged mean industry-level dependent variable	0.305 ***	0.019	0.346 ***	0.015	0.428 ***	0.016
Lagged industry competition	0.135	0.265	-2.372 *	1.223	0.435 *	0.225
Rule of law	-0.011 ***	0.004	0.259 ***	0.023	-0.001	0.004
GDP per capita	0.144 ***	0.007	0.546 ***	0.039	0.218 ***	0.007
Constant	-1.392 ***	0.065	-3.118 ***	0.384	-2.090 ***	0.066
Number of observations	1,214,885		1,233,272		1,215,148	
Firm- and Year-fixed effects	YES		YES		YES	
R-squared	0.580		0.892		0.552	
F statistics	297.270 ***		471.140 ***		470.120 ***	
Turning point	1.293		2.153		1.130	
Sasabuchi's test statistics	0.660		0.280		1.050	
95% Fieller confidence interval	N/A N/A		N/A N/A		N/A N/A	

Standard errors are robust and clustered at the firm-level. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.1 levels.

Table 6. Results of the PSM procedure (hypothesis 1)

Year 2012				
Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.024	0.023	0.001	0.88
On support observations	25,155	55,943		
Off support observations	5	0		
Asset turnover	1.722	1.521	0.201	17.35***
On support observations	25,165	55,995		
Off support observations	5	0		
ROA	0.040	0.033	0.007	6.25***
On support observations	25,158	55,959		
Off support observations	5	0		
Year 2013				
Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.030	0.028	0.002	2.26**
On support observations	39,984	113,727		
Off support observations	0	0		
Asset turnover	1.781	1.547	0.234	24.13***
On support observations	40,001	113,860		
Off support observations	0	0		
ROA	0.048	0.039	0.009	9.64***
On support observations	39,991	113,784		
Off support observations	0	0		
Year 2014				
Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.036	0.036	0.000	0.02
On support observations	42,855	118,017		
Off support observations	6	0		
Asset turnover	1.796	1.553	0.243	25.65***
On support observations	42,885	118,143		
Off support observations	6	0		
ROA	0.056	0.047	0.008	9.27***
On support observations	42,864	118,065		
Off support observations	6	0		
Year 2015				
Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.045	0.044	0.001	1.00
On support observations	54,326	116,129		
Off support observations	10	0		
Asset turnover	1.810	1.557	0.252	30.19***

On support observations	54,353	116,305		
Off support observations	10	0		
ROA	0.066	0.050	0.011	14.71***
On support observations	54,331	116,191		
Off support observations	10	0		

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Year 2016

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Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.047	0.049	-0.001	-1.82*
On support observations	62,682	115,341		
Off support observations	0	0		
Asset turnover	1.809	1.579	0.230	29.71***
On support observations	62,798	115,804		
Off support observations	0	0		
ROA	0.068	0.058	0.010	13.65***
On support observations	62,694	115,384		
Off support observations	0	0		

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Year 2017

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Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.050	0.052	-0.002	-3.03***
On support observations	65,856	116,733		
Off support observations	1	0		
Asset turnover	1.856	1.621	0.235	30.77***
On support observations	66,699	118,528		
Off support observations	1	0		
ROA	0.073	0.063	0.010	13.47***
On support observations	65,864	116,779		
Off support observations	1	0		

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Year 2018

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Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.049	0.053	-0.004	-4.87***
On support observations	68,791	115,815		
Off support observations	3	0		
Asset turnover	1.899	1.666	0.233	30.70***
On support observations	70,889	120,053		
Off support observations	3	0		
ROA	0.072	0.063	0.009	12.00***
On support observations	68,800	115,842		
Off support observations	3	0		

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Year 2019

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Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.049	0.054	-0.005	-5.36***

On support observations	49,756	86,799		
Off support observations	8	0		
Asset turnover	1.946	1.731	0.215	23.96***
On support observations	52,789	92,248		
Off support observations	8	0		
ROA	0.074	0.067	0.008	8.58***
On support observations	49,759	86,821		
Off support observations	8	0		

---

\*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.1 levels, respectively.

Table 7. Results of the PSM procedure (hypothesis 1)

Year 2012				
Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.020	0.019	0.001	0.25
On support observations	3,554	77,376		
Off support observations	2	0		
Asset turnover	1.823	1.944	-0.121	-3.08***
On support observations	3,557	77,434		
Off support observations	2	0		
ROA	0.037	0.036	0.001	0.32
On support observations	3,555	77,404		
Off support observations	2	0		
Year 2013				
Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.025	0.021	0.004	1.12
On support observations	5,347	148,232		
Off support observations	0	0		
Asset turnover	1.895	1.922	-0.027	-0.85
On support observations	5,350	148,372		
Off support observations	0	0		
ROA	0.046	0.043	0.003	0.8
On support observations	5,347	148,296		
Off support observations	0	0		
Year 2014				
Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.035	0.026	0.009	2.64***
On support observations	6,151	154,581		
Off support observations	1	0		
Asset turnover	1.944	2.012	-0.068	-2.22**
On support observations	6,157	154,270		
Off support observations	1	0		
ROA	0.060	0.054	0.006	1.93*
On support observations	6,153	154,636		
Off support observations	1	0		
Year 2015				
Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.040	0.037	0.004	1.29
On support observations	7,734	162,707		
Off support observations	2	0		
Asset turnover	1.975	2.038	-0.062	-2.33**
On support observations	7,738	162,906		
Off support observations	2	0		
ROA	0.067	0.064	0.003	0.97

On support observations	7,736	162,772		
Off support observations	2	0		

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Year 2016

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Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.043	0.042	0.001	0.52
On support observations	8,962	168,947		
Off support observations	4	0		
Asset turnover	1.984	2.078	-0.094	-3.74***
On support observations	8,978	169,507		
Off support observations	4	0		
ROA	0.071	0.067	0.004	1.76*
On support observations	8,965	168,999		
Off support observations	4	0		

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Year 2017

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Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.047	0.041	0.006	2.08**
On support observations	9,119	173,414		
Off support observations	1	0		
Asset turnover	2.015	2.117	-0.102	-4.06***
On support observations	9,231	175,940		
Off support observations	1	0		
ROA	0.075	0.073	0.003	1.02
On support observations	9,123	173,464		
Off support observations	1	0		

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Year 2018

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Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.047	0.044	0.003	1.05
On support observations	9,041	175,508		
Off support observations	1	0		
Asset turnover	2.094	2.149	-0.055	-2.16**
On support observations	9,194	181,690		
Off support observations	1	0		
ROA	0.076	0.073	0.003	1.18
On support observations	9,044	175,541		
Off support observations	1	0		

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Year 2019

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Variables	Treated group	Control group	Difference	t statistics
Operating margin	0.044	0.040	0.004	1.01
On support observations	5,676	130,767		
Off support observations	0	0		
Asset turnover	2.161	2.282	-0.121	-3.63***
On support observations	5,859	139,063		
Off support observations	0	0		

ROA	0.078	0.077	0.001	0.26
On support observations	5,676	130,792		
Off support observations	0	0		

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\*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05, and 0.1 levels, respectively.