

Show me how to grow fast in turbulent times: Balancing human resource practices between employee training and educational attainment

Ioannis Giotopoulos^{a*}, Vasilis Konstantinou^b, Alexandra Kontolaimou^c, Aggelos Tsakanikas^d

Abstract

This paper explores human resource (HR) practices that high-growth firms (HGFs) are likely to use in adverse economic conditions, focusing on the educational level of employees they hire and the provision of formal employee training. Alternative sets of HGFs are considered based on absolute, relative and Birch measures of employment growth using survey data on 1500 Greek firms at the peak of the economic crisis. The results reveal two different patterns in HR practices pursued by small and large HGFs in turbulent times. Specifically, we find that HGFs of larger size tend to employ persons with lower educational attainment and subsequently invest in formal training in order to increase their skills. On the contrary, smaller HGFs prefer to hire employees with specialized knowledge acquired from advanced formal education and avoid the provision of subsequent training. The findings have significant theoretical and policy implications emphasizing the way large and small HGFs manage the human capital embedded in their employees to outperform in crisis-hit economies.

Keywords: High-growth firms; Human resource practices; Employee training; Educational attainment; Crisis

JEL codes: L25; L26; O15

^a Assistant Professor, University of Peloponnese, School of Economics and Technology, Department of Economics, Tripoli, Greece, e-mail: giotopoulos@uop.gr

^b PhD Candidate, University of Peloponnese, School of Economics and Technology, Department of Economics, Tripoli, Greece, e-mail: v.konstant@uop.gr

^c Research Fellow, Centre of Planning and Economic Research (KEPE), Athens, Greece, e-mail: alexandra.kontolaimou@kepe.gr

^d Associate Professor, National Technical University of Athens, Laboratory of Industrial and Energy Economics, Athens, Greece, e-mail: atsaka@central.ntua.gr

*Corresponding author: Ioannis Giotopoulos, e-mail giotopoulos@uop.gr, tel: +302710230173

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1. Introduction

The substantial contribution of high-growth firms (HGFs) to the job generation process and economic development has attracted increasing academic interest (Acs & Mueller, 2008; Coad et al., 2014a; Delmar et al., 2003). HGFs have been recognized as the main driving force of economic growth as opposed to self-employment activity and new ventures with limited growth prospects (Shane, 2009; Stam et al., 2009; Wong et al., 2005). Several studies attempt to decode various aspects of HGFs, primarily focusing on structural business characteristics related to their size, age, sector, location etc. Some stylized facts confirm that a small proportion of HGFs seem to create the majority of new jobs (Henrekson & Johansson, 2010; Storey, 1994). HGFs tend to be young (Delmar et al., 2003; Haltiwanger et al., 2013), and of rather small size (Delmar et al., 2003; Shepherd & Wiklund, 2009; Weinzimmer et al., 1998) they do not belong to a particular industry (Delmar et al., 2003; Halabisky et al., 2006), but they are located in urban or accessible rural areas (Acs & Mueller, 2008; Stam, 2005).

However, the way HGFs employ and manage their human resources to achieve high growth rates is a rather under-researched topic, though a number of studies emphasize the crucial role of firms' HR management decisions in whether and how fast they will grow (Guerci, 2019; Saridakis et al., 2017). Harney and Alkhalaf (2021) note that the relationship between growth and HR management is rather unclear highlighting the great value in investigating the nature and contribution of human resources in firms with rapid growth. Thus, given that HGFs seem to be responsible for a large share of new jobs, it is crucial to understand their internal organization and the characteristics of employees that these firms tend to hire in different contexts (Coad et al., 2014b; Demir et al., 2017).

To address these issues, related research commonly draws on the human capital theory (Becker, 1964) that links human capital to employee performance at a first level and organizational performance and firm growth at a second level. In this context, firms may invest

in enhancing human capital of employees through hiring highly educated workers or training their current personnel. Employee general skills developed through formal education may increase the return for workers since they are tradable in competitive labor markets (Becker, 1964; Coff, 1997). Therefore, general human capital can be highly transferable, and the firm may appropriate some of the value created only to the extent that switching to another employer is hindered (Coff, 1997).

On the other hand, the significance of firm specific human capital is commonly underscored as a critical source of sustainable competitive advantage in strategic management literature (Chadwick & Dabu, 2009; Hatch & Dyer, 2004; Wang et al., 2009). The human capital that is specific to the firm adds more value to the current employer than to other employers, generating a gap between the value of employee skills in the focal firm and their value to other employers (Raffie & Coff, 2016). According to the classical human capital theory, this gap may result in a lower wage for employees wishing to move to another firm, thus it operates as an impediment to employee mobility (Hashimoto, 1981; Jovanovic, 1979; Parsons, 1972).

A common way to develop firm-specific skills and knowledge to employees is training (Dierickx & Cool, 1989: 1505; Raffie & Coff, 2016) which is linked to enhanced job satisfaction, increased employee productivity, reduced employees' mobility intention (Tett & Meyer, 1993) and ultimately to building sustainable competitive advantage. Yet, it is often noted that direct and indirect costs that investing in training entails may offset productivity gains (Sels et al., 2006). Overall, human capital theory commonly underpins the debates around the role of external formal education and training provision in the performance of employees and firms. Yet, despite the common use of the theoretical domains of human capital and HR management in identifying theoretically informed drivers of high growth, the literature on

HGFs lacks a fully pledged theoretical framework for examining these issues (Demir et al., 2017).

In empirical terms, a rather limited number of studies explores the role of HR practices in HGFs providing mixed results. Coad et al. (2014b) find that though HGFs benefit more from recruiting individuals with lower educational level at the first stages of their growth path, their recruitment strategy seems to change at later stages preferring highly educated and skilled employees. Hölzl (2009) provides evidence that high educational attainment is negatively associated with exceptional growth performance for southern and continental European countries, while a positive linkage is reported for northern European countries lying close to the technological frontier. Recently, considering a set of formal HR practices, López et al. (2019) find a positive effect of adopting a performance appraisal and an R&D system on the financial performance of established HGFs, but a negative impact of training activity in the case of emergent HGFs.

This paper adds to the relevant discussion by exploring HR practices that HGFs are likely to employ, emphasizing the educational level of employees they hire and the provision of formal employee training under turbulent economic conditions. More specifically, it explores whether there is a balance or a trade-off for HGFs between recruiting individuals with ex ante high educational level on the one hand and providing formal training to enhance their employees' skills on the other hand. To our knowledge, evidence on this issue within a crisis context is absent in the relevant literature. Given the importance of job creation and employment of individuals with high-quality human capital in crisis-hit economies, examining the HR practices in the context of HGFs may have a considerable impact in both theoretical and policy terms.

Importantly, our analysis also explores whether there are differentials in the HR practices used by HGFs which tend to be small compared to those which tend to be large. In

fact, the literature acknowledges the critical role that firm size may play in HR management (Harney & Alkhalaf, 2021; Nolan & Garavan, 2016). The growth measures we use to define and identify HGFs in our empirical analysis enables the implicit investigation of this issue. Extant literature on HGFs considering HR practices uses a single growth metric computed either in relative terms (e.g., Barringer et al., 2005; Coad et al., 2014b) or in absolute terms (e.g. Siegel et al., 1993), or the Birch index (e.g., Hölzl, 2009; Lopez-Garcia & Puente, 2012). However, as many scholars note, relative growth metrics tend to favor the participation of smaller firms in the identified set of HGFs, while absolute growth measures and the Birch indicator oversample larger firms (Hölzl, 2014). This research, using both absolute and relative measures of employment growth and the Birch index allows the identification of potential differentials in HR practices between groups of HGFs dominated by large and small-sized firms. Thus, it provides information about the potentially differentiated patterns in HR management between small and large HGFs under adverse economic conditions, that is an issue with theoretical, practical and policy value.

The paper is structured as follows. The next section describes key features of the economic environment of the surveyed firms mostly focusing on the crisis period. Section 3 presents the theoretical framework of our analysis followed by the description of the data and the methodology of our study in Section 4. The results of the empirical analysis are presented and discussed in Section 5. Section 6 concludes the paper, by providing relevant theoretical and policy implications and discussing limitations of the present study and directions for future research.

2. The economic environment of the surveyed firms

The dataset our analysis is based on refers to firms that operate in Greece. Greece represents a rather interesting case study for entrepreneurial policies related to firm growth and employment.

The economic crisis that burst in 2008 has resulted in a turbulent economic environment and a climate of increased uncertainty being particularly harmful for the performance and the viability of a large number of Greek firms (Georgopoulos & Glaister, 2018; Giotopoulos et al., 2017; Kritikos & Dreger, 2015; Williams & Vorley, 2015). Indeed, employment growth data from the firms of our sample¹ largely confirm the substantial crisis effects on firm performance as reflected in negative growth rates for about half of the examined firms between 2011 and 2013. Even though we focus on HGFs which are exemplars of job generation in times of crisis, it is interesting to note that the lowest 10% of the firm distribution represents the worst-performing firms which have been declined by more than 75%, resulting in significant job destruction.

Over the period 2008-2013, Greece lost about 25% of its gross domestic product, unemployment increased to the level of 27%, private consumption declined by almost 30%, while the production potential of the economy was adversely affected (European Commission 2013; 2017). In the context of the economic adjustment programs launched in 2010 as a way to deal with the sovereign debt crisis faced by Greece, strict austerity measures with an exclusive focus on “cost-competitiveness” and general labor market-based structural reforms were applied to support fiscal consolidation (Meghir et al., 2017). Nevertheless, the cost for the economy and society was proved very high in terms of loss of productive capacity, collapse of investment activity, unequal tax burden on society, poverty, high unemployment (Vassilopoulou et al., 2019). Also, crisis and austerity measures brought about a deterioration of working conditions in Greek firms linked to wage reductions and a low sense of employee entitlement (Chatrakul Na Ayudhya et al., 2019).

The combined effects of recession, extreme austerity, and a generalized mistrust of institutions and the political system have triggered an unprecedented emigration outflow of

¹ These data are presented in Table 1 and are discussed in detail in Section 4.

Greek citizens dominated by highly educated people seeking employment and better job opportunities in other countries (Chatrakul Na Ayudhya et al., 2019; Labrianidis & Pratsinakis, 2017). However, brain drain is not a new phenomenon in Greece. It can be primarily linked to the traditionally low demand for well-educated and highly skilled people in the labor market and, generally, to structural weaknesses of the Greek production model. The economic crisis revealed these long-standing weaknesses of the productive system and the business model that firms had been pursuing in the previous decades. During the “good times”, that is the period 1994 to 2008, GDP growth was not driven by growth-oriented entrepreneurship and technology- or innovation-oriented production. Instead of focusing on industrial and productive structural change, the vast majority of local firms preferred to focus mainly on internal markets and the production of low-cost products and services (Gourinchas et al., 2017). At the same time, although Greece exhibits high entrepreneurial rates, most of the reported entrepreneurial activity involves self-employment (Cowling, 2000; Livanos, 2009), making technology- and knowledge-driven growth more difficult to achieve.

Evidently, there is a current need for restructuring this productive and business system towards a growth trajectory closely associated with high firm growth prospects and industrial improvement based on innovation and high-quality human capital. The radical transformation of the pattern of entrepreneurial activity and production in this direction requires more efforts in terms of specific initiatives and actions to be highly prioritized on the industrial policy agenda. Hence, the Greek case may offer unique empirical insights that could be particularly valuable in designing policies for supporting firm growth and promoting an attractive working and business environment in crisis-hit economies.

3. Theoretical underpinnings and hypothesis formulation

Our conceptual background builds on the theoretical domains of human capital and firm growth. Human capital theory (Becker, 1964) asserts that employees' investment in knowledge, skills and abilities enhances their productive capacity (Garavan et al., 2021; Sels et al., 2006; Tharenou et al., 2007). In this context, the role of high-commitment or high-performance work practices has been also emphasized in advancing workers' productivity (e.g., Arthur, 1994; Becker & Huselid, 1998; Delery & Shaw, 2001; Huselid, 1995) and organizational performance (e.g., Ahmad & Schroeder, 2003; Gelade & Ivery, 2003). The most common ways for building and increasing employee human capital are education and training (e.g., Holton & Naquin, 2002; Nafukho et al., 2004).

Knowledge and skills that are developed through formal education are considered general and add value to the employee rather to the employer (Coff, 1997). This is because employees who have invested in education tend to switch employers seeking for the highest wage, thus they are likely to take the lion's share of firms' returns in competitive labor markets (Becker, 1964). In this sense, general human capital is highly transferable and may hardly constitute a source of competitive advantage for the firm, unless the employer is effective in reducing employees' mobility intention (Coff, 1997).

Human resource development is also considered a key element in Penrose's (1959) resource-based growth theory at the firm level. Yet, the relationship between firms' human resource development and high-growth performance is not straightforward (Demir et al., 2017). When firms aim at rapid growth, their managers may be so dedicated to the implementation of extended business plans that they have limited time to spend for the evaluation of the human capital embedded in new employees (Rajan & Zingales, 2001). These limitations may hinder the recruitment of new employees with the appropriate education and skills. On the other hand,

new employees with high educational attainment may need time to learn their new duties and thus learning curve effects may appear as the time goes by.

From the perspective of HGFs, there is a rather limited number of studies which examine the educational level of employees in relation to high growth performance, albeit providing mixed results. Specifically, a few empirical studies tend to argue that employees with a high educational level may increase the probability of firms growing fast (Foss & Ishikawa, 2007; Foss et al., 2008), implying that HGFs should prefer to hire individuals with high educational attainment. Consistently, Agudo et al. (2011) report some descriptive statistics according to which HGFs have on average more employees with a university degree (70%) in comparison with the typical firms (57%). Furthermore, Lopez-Garcia and Puente (2012) provide evidence suggesting that qualified personnel contribute to high growth performance.

On the other hand, Coad et al. (2014b) based on a sample of Swedish HGFs found a statistically significant negative relationship between the educational level and the possibility of recruitment at the first stages of firms' rapid growth path, suggesting that individuals with lower educational attainment are more likely to be preferred by HGFs. Firms with strong growth ambitions need to employ low-educated individuals to begin their fast growth, as these workers may be more committed and receive in-house training (Eisenhardt & Schoonhoven, 1990; Lepak & Snell, 1999). However, at later stages of their high-growth episode, HGFs seem to change their recruitment strategy hiring workers with high educational attainment (Coad et al., 2014).

Providing evidence in a country context, Hölzl (2009) finds that higher educational levels of employees are negatively associated with high growth performance for firms located in the most technologically advanced member states of the European Union. However, this relationship becomes positive for HGFs in southern and continental European Union member states. As the author explains developing countries that stay behind the technological frontier

will typically pursue a capital accumulation growth strategy. At this development stage, there is less incentive for HGFs to be highly selective in terms of educational attainment and skills when choosing employees and managers, as this is a costly process (Acemoglu et al., 2006; Hölzl, 2009).

The cost perspective may be useful in explaining why it might not be always beneficial for HGFs to recruit individuals with a high educational level. Normally, highly educated, or skilled individuals will demand higher wages, increasing in this way the labor cost for the firm. In addition, those skilled individuals pursuing promotion and career ambitions are normally characterized by low commitment to the firm and could easily switch to another enterprise (Feldman & Ng, 2007). Yet, high mobility rates in the labor market could increase the cost of employee recruitment and selection for all firms (Batt, 2002). Moreover, recruiting new employees, either low or highly educated, entails learning and adjustment costs which may have a negative impact on firm sales in the short run.

Given the above, it may be the case that HGFs opt for hiring employees with relatively low educational level as a cost-efficient strategy. This may be particularly relevant to crisis-hit economies where access to financial sources is limited, unemployment and uncertainty is high and brain-drain phenomenon is usually intensified. Notably, such persisting adverse conditions along with declining federal minimum wages as a policy response to crisis may lead to the transformation of a high-labor cost to a low-labor cost economy (Garavan et al., 2021), this being the case even for developed countries. In such a highly volatile environment, fast-growing firms being committed to the strategic implementation of their growth plans, are likely to benefit more from recruiting low-educated and committed individuals than highly educated persons, since such a practice may lead to considerable cost savings due to lower wages and lower recruitment costs. Based on the above we formulate the following hypothesis:

H1: HGFs tend to hire low-educated employees in turbulent times.

Firms may also enhance the human capital of their employees by investing in training. Training is commonly considered a popular firm practice to improve human capital outcomes, such as job satisfaction, self-confidence, commitment and productivity, and, consequently, impact on firm organizational performance (Sung & Choi, 2014; Tharenou et al., 2007). Particularly, training results in the development of a great depth of employees' knowledge, skills and abilities which may lead to increased employee flexibility and effectiveness in performing various tasks (Somaya et al., 2008), resulting in enhanced organizational outcomes.

Moreover, a firm's investment in training help workers to develop specialized knowledge and skills which are largely specific to the firm, thus less valuable to other enterprises for which they would pay less. In this way, firm-specific knowledge and skills are likely to create a gap between employees' value in their current job and their value in the next best alternative, allowing current employer to appropriate some of the value created (Coff, 1997). Thus, the development of firm-specific human capital through training makes it more difficult for another firm to bid away trained employees, increases employees' loyalty and reduces workers' mobility intention, ensuring, ultimately, firm competitive advantage (Becker & Gerhardt, 1996). In general, the theoretical and/or empirical literature highlights the significant role that employee training may play in shaping firm performance in terms of productivity (e.g., Bartel, 1994; Garavan et. al, 2021; Tharenou et al., 2007), employee task performance (e.g., Marescaux et al., 2019), financial returns (e.g., Darwish et al., 2019), innovation (e.g., Arvanitis et al., 2016; Caloghirou et al., 2018) and growth (e.g., Georgiadis & Pitelis, 2012; 2016).

However, high performance work practices like training are likely to also have negative employee outcomes due to work intensification, stress and job strain which may translate into increased absenteeism and/or turnover rates in the long run, cancelling out productivity gains (Ramsay et al., 2000; Sels et al., 2006). Indeed, a number of studies emphasizes the potential

negative effects of training on the cost-structure of the firm and employee performance due to work intensification and stress which may have organizational and financial implications for enterprises (Harney & Alkhalaf, 2021; Sels et al., 2006).

Despite the cost-generating aspects of training provision, empirical analysis for HGFs in the United States and United Kingdom shows that there is a positive relationship between employee training and high growth performance (Barringer et al., 2005; Sims & O'Regan, 2006). Also, it is found to be beneficial for HGFs which try to grow through innovation strategies (Barbero et al., 2011; Gallié & Legros, 2012; Laursen & Foss, 2003). Importantly, training is linked to flexibility which is considered crucial for enhancing organizational performance (Garavan et al., 2021) and for coping with and responding to changes in working conditions (Guest, 2002). Similarly, the role of training may be critical when firms face strategic challenges, negative incidences, external shocks, and uncertain situations. Training people and leaders contributes to organizational crisis preparedness and increases chances of survival and outperforming (Koronis & Ponis, 2018). Through training an enterprise may build resilience in times of uncertainty and crisis by effectively altering the combination of routines, practicing new ways to solve problems, and avoiding groups' work disruptions (Suarez & Montes, 2020). Thus, the second hypothesis to test can be written as follows:

H2: HGFs tend to invest on employee training in turbulent times

4. Data and methodology

The data used in the empirical analysis come from an extensive field survey aimed at 2000 Greek firms approached in two waves. The first wave took place in 2011, while the second wave was held two years later, i.e., in 2013 targeting the same group of firms that had

participated in the first wave². An adequate common sample of firms was secured from both waves, since 1500 enterprises, that is 75% of the surveyed firms in either wave completed the questionnaire. Hence, the final sample contains 1500 Greek firms, representing those firms that participated in both survey waves.

In our context, the second survey wave of 2013 represents the peak of the Greek economic crisis, while the 2011 wave denotes the burst of the crisis. As a matter of fact, the recessionary cycle of the Greek economy begun in 2008, along with the burst of the global economic crisis, where a negative growth rate in the GDP was recorded (-0.3%). By the end of 2011 the accumulative recession was -18% of the Greek GDP. At the end of 2013, Greece had lost 26.4% of its GDP, while in 2014 a slight positive rate was reported (+0.4%). That is why we consider the year 2013 as a crucial milestone representing the peak of the Greek economic crisis (European Commission 2017).

The survey was based on a structured questionnaire including: (a) questions on the adopted strategies pursued by the examined firms, (b) performance questions referring to firms' investment plans and economic performance along with their expectations for the subsequent years, (c) questions on their innovation performance, R&D activity, patent activity, and (d) questions related to firms' HR management. All interviews were undertaken through the CATI method, and the contact person was in the vast majority of the cases the CEO of the firm.

The literature uses different definitions of HGFs. In some studies, HGFs are defined as those firms that grow at a rate greater than a specific threshold, for example a firm which manages to increase its volume of sales by 50% (Halabisky et al., 2006). Other studies use the definition proposed by Eurostat and OECD, according to which a firm is classified as HGF if it had at least 10 employees in the first year and shows an annual growth of employees above

² Contact persons' details were available (e-mail, telephone, etc.) from the first wave, so they were contacted and asked to also participate in the second survey wave.

20% for a 3-year period (Hölzl, 2014). Another definition is based on the firm growth distribution in a given sample, identifying as HGFs those enterprises corresponding to 1%, 5%, or 10% of firms with the highest growth rate (Coad et al., 2014b). Regarding the growth indicator, the majority of relevant studies uses the number of employees and/or sales (Daunfeldt et al., 2014; Shepherd & Wiklund, 2009). Some studies show that different growth indicators do not affect results, although the composition of HGFs can be affected by the growth metric (Almus, 2002; Coad et al., 2014a; Daunfeldt et al., 2015).

However, relative growth measures, such as percentage changes or logarithmic differences in terms of employees or sales, tend to favor the participation of rather small firms in the group of HGFs, while on the other hand absolute measures, such as absolute changes in employees or sales, lead to the identification of rather large firms as HGFs (Coad et al., 2014a; Delmar et al., 2003; Demir et al., 2017). This bias favoring the over-representation of large firms is also inherent in the Birch index which combines relative and absolute changes of employment (Hölzl, 2014). Formally, the Birch indicator is defined by the expression: $(E_t - E_{t-k}) \cdot \left(\frac{E_t}{E_{t-k}}\right)$, where E_t stands for the number of employees for the period t , and k is the time lag.

In this study we use the changes in the number of employees between the two survey waves for the construction of three growth indicators (absolute growth, relative growth, and the Birch index), since we are mostly interested in the significant implications that HGFs may have for job creation, as noted by many scholars (Coad et al., 2014a; Daunfeldt et al., 2014; Henrekson & Johansson, 2010). Specifically, we compute the following growth measures:

- Relative employment growth = $\ln(E_{2013}) - \ln(E_{2011})$
- Absolute employment growth = $E_{2013} - E_{2011}$
- Birch indicator of employment growth = $(E_{2013} - E_{2011}) \cdot \left(\frac{E_{2013}}{E_{2011}}\right)$,

where E_{2013} and E_{2011} stand for the number of employees for the year 2013, and 2011 respectively.

Based on these growth metrics we construct our dependent variable (HGF), that is a binary variable which takes the value of 1 if the firm belongs to the upper 10% of the firm growth distribution in our sample, and 0 otherwise. This is in the same line with other studies which adopt an empirical rule in order to define HGFs based on the upper 1%, 5% or 10% of the growth distribution of firms in their sample over a specific time period (see for example Almus, 2002; Coad et al., 2014a, 2014b; Hölzl, 2009; Stam & Wennberg, 2009)³. Table 1 presents the percentiles of the firm growth distribution for the three different growth metrics we use. The last column of Table 1 (90% percentile) shows the minimum employment change that is needed in order for a firm to be characterized as HGF. We can see that a firm must grow in the examined period by 37% in relative growth terms and by 20 (24) employees based on the absolute (Birch) growth measure.

“Insert Table 1 about here”

Since, our analysis focuses on HR practices of HGFs we use the following explanatory variables:

- Employee Training (*Training*): A binary variable which takes the value of 1 if the firm provides formal employee training programs⁴.
- Tertiary Educational Attainment (*TertEduc*): A continuous variable measured by the share of employees with a university degree (%).

³ Alternative definitions of HGFs based on the upper 1% or 5% of the firm growth distribution were not adopted since they lead to a very low number of HGFs in our sample.

⁴ The lack of information about informal employee training or qualitative characteristics of formal training programs does not enable the inclusion of more precise measures of training. See, for example, Kotey and Folker (2007) for a discussion emphasizing informal training practices in SMEs and Garavan et al. (2021) for a discussion on the importance of quality apart from quantity of training programs provided to employees.

- Advanced Educational Attainment (*AdvEduc*): A continuous variable measured by the share of employees with a PhD and/or a master's degree (%).
- Young Employees (*YoungEmpl*): A binary variable which takes the value of 1 if the percentage of employees with age under 29 years is greater than the percentage of employees with age above 29 years old⁵.
- Gender of Employees (*Gender*): A continuous variable measured by the share of women employees (%).
- Exporting Activities (Exports): A binary variable which takes the value of 1 when the firm is an exporter.
- Liquidity Constraints – Bank Credit: A categorical variable measured on 1 to 5 Likert scale reflecting the level of credit conditions due to banks inability to provide loans.

Furthermore, we control for firm age and size. Firm age is calculated by the number of years since the establishment year, while firm size is calculated by the logarithm of the number of employees in the initial year of the examined period (2011). We also include a set of industry dummies classified according to NACE two-digit industry codes which cover manufacturing, construction, trade, and services sectors. Following a multi-sector approach is consistent with several studies which suggest that HGFs emerge in all sectors and not only in high-technology or manufacturing industries (Henrekson & Johansson, 2010; Mason & Brown, 2013). The fact that HGFs are not industry-specific is particularly relevant from a policy perspective, questioning policies which target specific sectors as principal sources of HGFs (Mason & Brown, 2013).

⁵ This cut off point was used following the labor demographics provided by Eurostat (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Being_young_in_Europe_today_-_labour_market_-_access_and_participation).

Table 2 reports some summary statistics for the explanatory variables according to which on average almost 30% of the firms' employees have university education and only 4.2% have more advanced educational attainment, i.e., a master's or a PhD degree. According to national data for the corresponding years, the percentage of employees with tertiary education in the whole economy is 40.5%, while 3.3% have a master or a PhD degree⁶. By taking into consideration that certain sectors such as financial institutions and the public sector (i.e., education and healthcare where most of their employees are tertiary education graduates) are not represented in the survey, we believe that these rates in the sample are representative of the sectors that are covered.

With regard to the age of employees, on average 18% of employees in the firms of our sample are under 29 years old. Female employees represent only 34% of the total number of employees for the average firm. With respect to training, more than 70% of firms provide formal training programs to their employees. Regarding firm age, the youngest firm is 4 years old, the oldest firm is 95 years old, while the average firm age is 24 years. The descriptive statistics also show that almost 48% of Greek firms encounter severe liquidity constraints (4 and 5 value of Likert scale) because of the banks' inability to provide loans. Furthermore, 47% of our sampled firms appear to engage in exporting activities.

“Insert Table 2 about here”

Table 3 presents the distributions of the examined sets of HGFs across size groups (micro, small, medium, large) as defined by European Commission (2003). These data corroborate the inherent biases of the alternative growth indicators as mentioned above, that is the over-representation of small-sized firms in the HGFs group when the relative growth metric

⁶ The data come from the Labour Force Surveys for 2011 and 2013 conducted by the Hellenic Statistical Authority (<https://www.statistics.gr/en/statistics/-/publication/SJO03/->).

is used and the dominance of larger firms when the absolute growth or the Birch indicators are employed.

“Insert Table 3 about here”

Furthermore, we check whether there is any significant correlation among the independent variables. The correlation matrix provided in Table 4 indicates the absence of high correlation between the independent variables, ensuring that estimates are not biased due to possible multicollinearity problems.

“Insert Table 4 about here”

Our econometric analysis is based on the estimation of the following equation:

$$\begin{aligned}
 HGF_{i,2013} = & \beta_0 + \beta_1 Training_{i,2011} + \beta_2 TertEduc_{i,2011} + \beta_3 AdvEduc_{i,2011} + \\
 & \beta_4 YoungEmpl_{i,2011} + \beta_5 Gender_{i,2011} + \beta_6 Exports_{i,2011} + \beta_7 LiqConst_{i,2011} + \\
 & \beta_8 Size_{i,2011} + \beta_9 Age_{i,2011} + u_i
 \end{aligned} \tag{1}$$

where HGF_i indicates whether firm i belongs to the upper 10% of the firm growth distribution.

The explanatory variables $Training_i$, $TertEduc_i$, $AdvEduc_i$, $YoungEmpl_i$, $Gender_i$, $Exports_i$, $LiqConst_i$, $Size_i$, Age_i stand for employee training, tertiary educational attainment, advanced educational attainment, young employees, gender, exporting activities, liquidity constraints – bank credit, size and age of firm i in the year 2011, respectively. Moreover, u_i is the random error term and β denotes the vector of the coefficients to be estimated.

We estimate three models in the form of equation (1) corresponding to the three alternative growth metrics we use to define HGFs as described above. The dependent variable is measured by a binary variable in all cases. Hence, we use probit regressions to identify potential determinants of the probability that the firms exhibit high growth rates. We also

compute the marginal effects of the explanatory variables on the probability of a firm belonging to the group of HGFs for each of the three examined models. As a robustness test, we also estimate our models using logit regressions.

5. Results

Table 5 presents the estimation results of equation (1) for the three different growth metrics we use to define HGFs. Our results from all models (Models 1, 2 and 3) indicate that tertiary educational attainment is associated with a decreased likelihood of a firm experiencing a high growth performance in terms of employees. Moreover, specialized knowledge of employees acquired through postgraduate studies does not seem to play any significant role when we use the absolute growth and the Birch indicators (Models 2 and 3). Given that these measures result in HGFs groups dominated by large firms -as explained above-, our results imply that larger HGFs tend to hire low-educated or low-skilled employees, thus confirming out first hypothesis (H1). On the other hand, based on the relative employment growth metric, specialized knowledge of employees acquired through postgraduate studies appears to positively affect the probability of belonging to the group of HGFs (Model 1). This result implies that HGFs of smaller size⁷ seem to select specialized and highly skilled employees and not employees with general tertiary education. Thus, our findings do not provide support for H1 in the case of smaller HGFs.

“Insert Table 5 about here”

In addition, employee training is found statistically significant with rather high corresponding marginal effects in Models 2 and 3, that is for HGFs that tend to be large. These results indicate that the provision of employee training programs appears to significantly

⁷ We note again that small-sized firms tend to be over-represented in the group of HGFs determined with the use of a relative employment growth metric, as explained in Section 4.

increase the probability for larger firms experiencing a high growth event. On the contrary, the provision of formal employee training does not seem to play any significant role in the case of smaller HGFs (Model 1). Hence, the results referring to employee training provide support for our second hypothesis (H2) when the group of HGFs is dominated by large-sized firms, while H2 is not confirmed by our estimations in case of small-sized HGFs.

Taken together, the abovementioned results reveal two differentiated patterns on how HGFs manage their human capital, with respect to the educational level of their employees and the provision of formal training. These patterns appear to substantially differ across the estimated models implying that firm size plays an important role for human resource management as argued by related studies (e.g., Harney & Alkhalaf, 2021; Nolan & Garavan, 2016; Saridakis et al., 2017). Based on the Birch and absolute employment growth metrics, the results show that HGFs of larger size prefer staff of lower educational level and at the same time they tend to heavily invest on employee training programs to advance the skills of their personnel. This means that firms do not appear to highly value the personal traits and skills of their staff but rather rely on employee training in order to increase the human capital imbedded in their employees (Barringer et. al, 2005; Tharenou et. al, 2007). Hiring staff with more advanced ex ante skills or educational attainment requires higher wages and this practice may be costly for large HGFs. Therefore, this type of firms may employ low-educated or unskilled individuals with lower wages, and then train them in order to expand their capabilities and skills, given that the cost of training may be lower than hiring high-human-capital employees (Batt, 2002; Coad et al., 2014b; Rajan & Zingales, 2001).

We should note here that HGFs are likely to experience financial constraints (Hall & Lerner, 2010; Martinsson, 2010), especially in turbulent times, this being the case in Greece during the examined period. Indeed, for all our models, liquidity constraints have a negative and significant impact on the probability of being a HGF (Models 1, 2, 3). These conditions

along with the critical mass of employees that large firms tend to hire when they grow fast entail a considerable payroll cost for job creation. On the other side, larger HGFs may exploit a form of scale economies in training, given the fact that the training programs they offer are utilized for a large number of newcomers. So, as a part of a cost-efficient strategy, firms may prefer to employ individuals with smaller wages than average (Rajan & Zingales, 2001) and invest in their training in order to maximize their production at the lowest possible cost, improving, in this way, the cost to benefit ratio (Lepak & Snell, 1999).

Furthermore, the choice of large HGFs to invest in employee training rather than in educational attainment in order to achieve high performance may be explained on the grounds of search and adjustment costs that may arise due to possible reallocation and mobility of employees from one firm to another (Batt, 2002). Employees' reallocation may also hurt a firm due to potential knowledge transfers to other firms. Thus, the development of firm-specific human capital through training, may be an attractive HR practice for large HGFs aiming at increasing employee commitment, creating value and, ultimately, improving their performance (Becker & Gerhardt, 1996).

Based on the relative employment growth metric a different pattern appears to hold for small-sized HGFs regarding the HR practices they appear to adopt under adverse economic conditions. In particular, our findings suggest that in a crisis context, HGFs of smaller size tend to employ individuals with advanced educational attainment (holding a PhD or MSc) and are not eager to provide formal training programs to their staff. This result may be explained on the grounds of the "liabilities of smallness" (Heneman & Berkley, 1999) which have implications for HR management practices being specific to firms of smaller size (Harney & Alkhalaf, 2021). According to Storey (2004) formal training is less likely to be provided by small-sized firms because the cost per employee is too high for them (Storey, 2004; Storey & Westhead, 1997) in terms of time and money (Reid, et al., 2002; Sánchez-Marín, 2019) and, consequently, formal

training is not considered an important investment for developing a vital firm resource (Mayson & Barrett, 2004). Indeed, the cost- increasing effects of related HR management practices on employee and firm performance outcomes may outweigh the value-creating effects of such practices in small firms (Sels et al., 2006), especially in adverse economic conditions. Moreover, in opposition to large enterprises, small organizations may lack training resources and expertise base to effectively implement formal employee training (Garavan et al., 2016). Hence, HGFs of smaller size are likely to avoid the provision of costly and difficult to implement formal employee training and, instead, invest on the recruitment of highly educated and skilled employees with specialized knowledge, as a preferred HR practice to increase their survival odds (Welbourne & Andrews, 1996) in crisis periods.

Regarding the individual-specific characteristics, the dummy variable for young employees has a significant positive impact in all the examined models (Models 1, 2 and 3), implying that an individual younger than 29 years is more likely to be employed in a firm growing fast. HGFs may prefer to employ younger individuals with less business experience, since this practice often results in significant cost savings for firms (Coad et al., 2014b). In the Greek context, this result may imply that firms which grow fast prefer younger and presumably “less expensive” individuals as part of a cost-efficient strategy they pursue to respond to the increased risks within a turbulent economic environment and offset the harmful impact of unanticipated economic disruptions. The lack of experience under this strategy scheme could be balanced in larger HGFs by employee training in order for firms to enhance the skills and knowledge of their staff (Model 2 and 3). With respect to the other individual characteristic under examination, i.e., the gender of employees, it is not found any significant relationship with high growth performance of the examined firms. Figure 1 illustrates the main patterns with respect to HR practices used by large and small HGFs in a crisis context, as revealed by our estimation results.

“Insert Figure 1 about here”

Finally, our results indicate that firm size positively affects the probability of growing fast in cases where absolute growth measure and the Birch indicator are used (Models 2 and 3). On the other hand, the effect appears to be negative when we use the relative employment growth (Model 1). These results verify our expectations on the dominance of larger firms in HGFs defined based on absolute and Birch growth metrics, and on the overrepresentation of small-sized firms in the group of HGFs when relative growth indicators are used (Coad et al., 2014a; Delmar et al., 2003; Demir et al., 2017; Hölzl, 2014). Moreover, in line with previous empirical studies (Parker & Storey, 2010), we find that firm age does not affect the probability for a firm achieving high growth rates,

Table 6 presents the estimation results of equation (1) for the three different growth metrics using logit regressions. The results are similar to those obtained from probit regressions, thus verifying the robustness of our estimations across different models.

“Insert Table 6 about here”

6. Conclusions

Theoretical implications

This study's contribution to the theoretical discussion on HGFs is threefold. First, extant literature on HGFs lacks a full-fledged theoretical framework which integrates the role of different HR practices for achieving rapid growth in normal times, let alone in adverse economic conditions. Demir et al. (2017) in their literature review on HGFs from a strategic management perspective emphasize the importance of the theoretical domains related to human capital and HR management in identifying theoretically informed drivers of high growth. Their review reveals a gap in our knowledge on the relationships between initial human capital of employees and the HR practices of HGFs highlighting the great potential for understanding

these linkages in the context of HGFs. Consistently, Harney and Alkhalaf (2021) reviewing the literature on HR management in SMEs, identify great opportunities in both empirical and theoretical terms from exploring HR experiences and challenges in fast growing SMEs. Furthermore, the implications of examining these issues in a crisis context, although presenting increased interest, are, generally, overlooked by related literature. Our study, building on human capital and firm growth theories contributes to the development of a theoretical framework for HGFs which emphasizes employee human capital and related HR practices as crucial factors for achieving exceptional growth in crisis-hit economies. Thus, we provide new insights into whether and how HGFs combine or reconcile different employee HR practices to achieve rapid growth under adverse economic conditions.

An additional contribution of our study relates to the growth metrics used which may have crucial implications for the research design and the interpretation of results. Existing empirical evidence on HGFs considering HR practices is based on relative growth measures (e.g., Barringer et al., 2005; Coad et al., 2014b; López et al., 2019), absolute growth indicators (e.g., Siegel et al., 1993) or the Birch index (e.g., Hölzl, 2009; Lopez-Garcia & Puente, 2012). Nevertheless, relative growth measures, by construction, tend to be biased favoring the participation of smaller firms in the group of HGFs identified, while larger firms are over-represented when absolute or Birch growth measures are used (Hölzl, 2014). This issue has received basically no attention in the HGFs literature which deals with HR management practices, although its importance in the general context of HGFs has been acknowledged (Daunfeldt et al., 2014; Demir et al., 2017). To address this issue, we use relative and absolute growth measures, as well as the Birch index in identifying HGFs and thoroughly consider those measures' implications for discussing our results. This is a novel and interesting addition to the HGFs literature examining HR management issues, since it advances our knowledge on potential differentials in HR practices pursued by small and large fast-growing firms in times

of crisis. Indeed, HR management literature commonly identifies differentials in HR practices between small-sized and large-sized firms (Harney & Alkhalaf, 2021; Nolan & Garavan, 2016; Saridakis et al., 2017), though evidence from HGFs in crisis-hit economies is basically absent.

Importantly, considering these implications in discussing our findings reveals two distinct patterns in HR practices used by small and large HGFs under adverse economic conditions. Specifically, large-sized firms that experience high growth performance appear to employ less educated individuals and then invest on their training in order to enhance their knowledge and skill base. On the contrary, small-sized firms with high growth events seem to opt for individuals who have advanced educational attainment at the first place, so that to avoid subsequent training. Therefore, we argue that in a crisis context different patterns of HR practices may hold between large and small HGFs, emphasizing the importance of firm size in theory-based considerations about the link between HR practices and high-growth performance.

Our final contribution refers to the joint examination of two significant HR practices of HGFs referring to the recruitment of highly (or low) educated employees and the provision (or the absence) of formal employee training. Existing studies on HGFs focus on either employees' education (Coad et al., 2014b; Hölzl, 2009) or employee training (Barringer et al., 2005; López et al., 2019) overlooking the implications of the potential balance or conflict in using these two HR practices to achieve rapid growth. Coad et al. (2014b) examines the educational level of employees that HGFs tend to hire; yet the role of employee training is only considered when providing a possible explanation for their finding on the Swedish HGFs' preference towards recruiting low-educated individuals. This study, by empirically exploring the role of employee education and staff training jointly advances our knowledge on whether there is a balance or a trade-off between HR practices related to hiring already skilled and experienced individuals on the one hand and investing in training programs in order to develop the required skills of inexperienced and low-educated employees on the other hand.

Policy implications

Given that Greece suffered from a severe economic crisis which led to an increase in unemployment along with alarming proportions of brain drain in the examined period (2011-2013), it would be insightful if policymakers had more stylized facts about the human resource practices of firms which managed to achieve high growth rates even in turbulent times.

A result derived from all estimated models concerns the employment of young employees. In particular, it was found that all the examined sets of large and small HGFs tend to prefer employees less than 29 years old. Hence, it seems that HGFs are the principal employer of many young people, contributing in that way to the entry of young people into the labor market and also to the reduction of youth unemployment. This finding is particularly relevant, given that in the case of Greece, the unemployment rate for young individuals lies between 50-60% for the examined period.

Also, given the accelerated outflows of young graduates and highly skilled workforce during the crisis years, particular emphasis should be placed on HGFs of smaller size which seem to prefer high- rather than low-educated employees. Overall, from a policy-making perspective, creating mechanisms for identifying and supporting HGFs with a special focus on whether and how human resource management can drive firms' high growth events appears to be of great significance. Such mechanisms and measures could be more useful in times of economic recession when efforts to restore a growth trajectory in the economy are, normally, intensified.

Limitations and further research

A limitation of this paper that should be acknowledged is the short time window frame (2011 and 2013) used in our analysis to identify HGFs and their potential drivers. Indeed, it may be the case that high growth patterns of fast-growing firms identified in a period tend not to persist in the next period (Daunfeldt & Halvarsson, 2015; Satterthwaite & Hamilton, 2017). Although

it may be of high research and policy interest to examine the issue under extraordinary economic conditions such as those in Greece within a rather short time period, replicating the results in a broader time frame would be highly valued, enhancing the robustness of our results. Similarly, expanding the firm sample would potentially enable the use of alternative definitions of HGFs based on the upper 1% or 5% of the firm growth distribution (see for example Coad et al., 2014b) as further robustness checks. In addition, given the significance of employee training in our research, considering both quantitative and qualitative characteristics in the training metrics employed would potentially provide further insight into the kind of training programs that may be relevant to HGFs. Finally, interesting future research directions could involve exploring the left tail of the firm growth distribution, i.e., the human resource practices of low-growth firms which may play a critical role in the job destruction process in an economy.

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Table 1. Summary statistics of firm growth metrics

	10% percentile	25% percentile	50% percentile	75% percentile	90% percentile
Absolute Employment Growth	-40	-13	-3	2	20
Relative Employment Growth	-0.7621	-0.3567	-0.1008	0.06062	0.3683
Birch indicator	-19.8	-7.9592	-1.8959	2.08	24

Table 2. Summary statistics of employee human capital and individual-specific characteristics

	Obs.	Mean	Standard Deviation	Min	Max
<i>Summary statistics for continuous variables</i>					
Tertiary Educational Attainment	1,502	30.20%	27.40%	0%	100%
Advanced Educational Attainment	1,387	4.23%	8.55%	0%	90%
Young Employees	1,422	18.50%	18.38%	0%	100%
Gender of Employees	1,403	33.55%	23.12%	0%	100%
<i>Frequencies for binary variables</i>					
	Obs.	Yes			
Training	1,488	70.77%			
Liquidity Constraints	1,475	47.86%			
Exporting	1,457	47.15%			

Table 3. HGFs and total sample distributions per size group

	Micro	Small	Medium	Large
HGFs based on the relative employment growth measure	32.89%	38.26%	23.49%	5.37%
HGFs based on the absolute employment growth measure	12%	25.33%	43.33%	19.33%
HGFs based on the Birch indicator of employment growth	12.67%	28%	41.33%	18%
Total sample	13.45%	47.07%	30.49%	8.99%

Table 4. Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Tertiary Educational Attainment (1)	1.00								
Advanced Educational Attainment (2)	0.26	1.00							
Training (3)	0.12	0.15	1.00						
Employees under 29 years old (4)	-0.03	-0.01	0.10	1.00					
Gender (5)	0.06	0.12	0.14	0.09	1.00				
Exports (6)	0.006	0.05	0.11	-0.09	-0.006	1.00			
Liquidity Constraints (7)	-0.03	-0.10	-0.07	-0.02	-0.12	-0.07	1.00		
Firm Size (8)	-0.02	0.12	0.29	0.14	0.47	0.16	-0.17	1.00	
Firm Age (9)	0.003	0.01	0.14	-0.12	0.07	0.11	-0.01	0.26	1.00

Table 5. Determinants of the probability of belonging to a group of HGFs

	Model 1 (Relative Employment Growth)	Model 2 (Absolute Employment Growth)	Model 3 (Birch indicator)
<i>Employee Human Capital</i>			
Tertiary Educational Attainment	-0.0078** (0.0024)	-0.0007** (0.0025)	-0.0009*** (0.0025)
Advanced Educational Attainment	0.0017** (0.0061)	0.0007 (0.0067)	0.0009 (0.0066)
Employee Training	0.0192 (0.1346)	0.0408** (0.1555)	0.0441** (0.1533)
<i>Individual-specific Characteristics</i>			
Young Employees	-0.0733** (0.1479)	-0.0725*** (0.1439)	-0.0741*** (0.1497)
Gender of Employees	-0.00006 (0.0007)	-0.0001 (0.0012)	-0.0001 (0.0010)
<i>Control Variables</i>			
Exports	-0.0243 (0.1210)	0.0024 (0.1191)	0.0020 (0.1191)
Liquidity Constraints	-0.0112* (0.0429)	-0.0103* (0.4420)	-0.0121** (0.0437)
Firm Size	-0.0194*** (0.0511)	0.0312*** (0.0484)	0.0245*** (0.0478)
Firm Age	0.0026 (0.1079)	-0.0160 (0.1083)	-0.0146 (0.1078)
Constant Term	-0.2620 (0.3833)	-1.4335 (0.3955)	-1.2229 (0.3902)
Log likelihood	-298.70	-293.60	-297.25
LR test (χ^2)	29.66	62.80	55.70
Number of obs	1043	1043	1044

Notes: The table reports marginal effects of probit regressions. *Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level. Standard errors are reported in parentheses. Industry dummies are included in all models.

Table 6. Determinants of the probability of belonging to a group of HGFs with Logit analysis

	Model 1 (Relative Employment Growth)	Model 2 (Absolute Employment Growth)	Model 3 (Birch indicator)
<i>Employee Human Capital</i>			
Tertiary Educational Attainment	-0.01015** (0.0048)	-0.01028** (0.0050)	-0.0123** (0.0051)
Advanced Educational Attainment	0.02194** (0.0113)	0.0081 (0.0127)	0.0105 (0.0124)
Employee Training	0.2364 (0.2619)	0.6369** (0.3188)	0.6529** (0.3112)
<i>Individual-specific Characteristics</i>			
Young Employees	-0.7944*** (0.2749)	-0.7597*** (0.2658)	-0.7790*** (0.26411)
Gender of Employees	-0.0009 (0.0018)	-0.0020 (0.0023)	-0.0017 (0.0022)
<i>Control Variables</i>			
Exports	-0.3349 (0.2409)	0.0665 (0.2297)	0.0683 (0.2305)
Liquidity Constraints	-0.1462* (0.0834)	-0.1502* (0.0858)	-0.1726** (0.0850)
Firm Size	-0.2666*** (0.1017)	0.4331*** (0.0924)	0.3374*** (0.0921)
Firm Age	0.0512 (0.2149)	-0.2408 (0.2073)	-0.2179 (0.2076)
Constant Term	-0.2068 (0.7505)	-2.5151*** (0.7519)	-2.0921*** (0.7446)
Log likelihood	-298.42	-293.79	-297.36
LR test (χ^2)	30.21	62.42	55.47
Number of obs	1043	1043	1044

Notes: The table reports marginal effects of probit regressions. *Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level. Standard errors are reported in parentheses. Industry dummies are included in all models.

Figure 1: Patterns of human resource practices of HGFs in times of crisis

