

Does the sector matter? An analysis of high-growth firms and industry growth rates

Peer-reviewed author version

DILLEN, Yannick & VANDEKERKHOF, Pieter (2021) Does the sector matter? An analysis of high-growth firms and industry growth rates. In: Journal of small business and enterprise development, 28(6), p. 927-945..

DOI: 10.1108/JSBED-02-2020-0053

Handle: <http://hdl.handle.net/1942/34676>

Does the sector matter? An analysis of high-growth firms and industry growth rates

Yannick Dillen and Pieter Vandekerckhof

Abstract

Purpose – This paper aims to analyze the effect of industry growth rates on the characteristics of high-growth firms (HGFs) that are active in a particular industry. By making a distinction between HGFs active in stable and declining industries and HGFs active in growing and high-growth industries, it is analyzed if the main dimensions of firm performance are significantly different for HGFs active in one of these different industry types. Gaining more insight into this industry aspect of high firm growth is important as governmental measures towards HGFs may be more effective if they have a specific sectoral focus.

Design/methodology/approach – A subset of 740 Belgian HGFs was analyzed. Data were gathered from the Belfirst database. HGFs were classified within their corresponding industry type: a declining industry (negative growth), a stable industry (0–5% growth), a growing industry (5–10% growth) and a high-growth industry (>10% growth). Four dimensions of structural firm performance that are expected to correlate with high growth were taken into consideration: productivity (value added per FTE), profitability (ROA), innovativeness (intangible assets) and financial health (solvency and liquidity). Tukey's range tests in conjunction with post-hoc analysis of variance (ANOVA) tests were carried out to test for significant differences in all the mentioned variables for the HGFs in the four different industry types.

Findings – Results show that HGFs active in a stable industry are not significantly more profitable or innovative than HGFs active in a growth industry. However, significant differences could be encountered when it comes to the other two dimensions of structural firm performance: productivity and financial health. It is shown that HGFs active in declining and stable industries are significantly more productive than HGFs active in growth industries and high-growth industries. Also, HGFs active in declining and stable industries have significantly higher liquidity ratios than firms active in growth industries, pointing towards a better financial health for HGFs in nongrowing industries.

Research limitations/implications – The results confirm the conceptual logic that the differences between resource-based view (RBV) and industrial organization (IO) propositions will have an impact on the drivers of firm performance and high business growth. Every future study that focuses on the growth determinants of HGFs should be aware that considering the subset of HGFs as one homogenous group may be suboptimal. It is likely that the growth determinants of both HGF types will indeed be fundamentally different.

Originality/value – Until now, all studies on HGFs have considered the subset of HGFs as a whole. This paper tried to disentangle the subset based on the growth rate of the industry in which HGFs are mainly active. In this proposition, a reason for the lack of knowledge about characteristics of HGFs may – at least partially – be found in the fact that industry membership plays an important role in determining the characteristics of a high-growth firm. Future studies focusing on high-growth determinants may benefit from systematically taking the industry growth rates into account, with the knowledge that the propositions of two different theories – IO and RBV – may be the fundamental drivers of a firm's high-growth rates.

Keywords: High-growth firms, Industry growth, Resource-based view, Industrial organization

1. Introduction

The academic interest in high-growth firms (HGFs) has been on the rise for several years as these companies appear to contribute disproportionately to the net job creation (e.g. Anyadike-Danes et al., 2015), productivity growth (e.g. Daunfeldt et al., 2010) and economic growth (e.g. Henrekson and Johansson, 2010; Sleuwaegen and Ramboer, 2020) in a region or country.

The term “high-growth firms” refers to those businesses that realize a high rate of growth in a certain growth indicator for a given time period. In any region, there exists subsequently a group of firms that are – on the basis of a certain definition – identified as HGFs. In their seminal work on HGFs, Delmar et al. (2003) stated that the subset of HGFs is extremely heterogeneous. This heterogeneity is manifested in characteristics such as age, size, profitability, location and industry of the HGFs. Several high-quality papers have emerged which focus on the heterogeneity in location (e.g. Giner et al., 2016; Li et al., 2016; Bogas and Barbosa, 2014), growth persistence (Moschella et al., 2019; Daunfeldt and Halvarsson, 2015), firm size (Decker et al., 2016), firm age (Coad et al., 2016; Navaretti et al., 2014) and profitability (Delmar et al., 2013) of HGFs.

With respect to the industry in which HGFs operate, there have been several papers focusing on how the presence of HGFs affects the growth of a certain industry over time (Bos and Stam, 2013) and on the industries that show an underrepresentation or overrepresentation of HGFs (Daunfeldt et al., 2016). It appeared that an increase in the prevalence of HGFs in an industry has a positive effect on subsequent industry growth (Bos and Stam, 2013) and that HGFs are overrepresented in knowledge-intensive service industries (Daunfeldt et al., 2016). These studies have given clear insights into the importance of the amount of HGFs in a certain industry and on the industries in which HGFs typically operate.

However, to our knowledge, no study has explicitly focused on the link between industry growth rates and the different central channels through which firms might achieve substantial growth performance, namely innovativeness, efficiency, profitability and financial health (Bianchini et al., 2017). Through the use of these four specific dimensions, we look beyond the mere demographic aspect and look at differences related to more structural performance characteristics (e.g. Jovanovic, 1982; Silverberg et al., 1988; Dosi et al., 1995; Ericson and Pakes, 1995; Cooley and Quandrini, 2001; Luttmer, 2007; Bianchini et al., 2017). As such, we capture several key distinguishing features of competitive selection and growth (Bianchini et al., 2017). Therefore, the main research question of this paper will be “Do HGFs

that are active in growing industries have different characteristics than HGFs that are active in nongrowing industries?”

In this paper, we aim to analyze if significant differences exist in a number of structural characteristics of HGFs that are active in (high-) growth industries versus HGFs active in stable or declining industries. Intuitively, one can assume that a number of firms in the HGF subset are active in industries with strong growth rates whereas a number of other HGFs are present in industries that go through a period of moderate or even negative growth. The characteristics of these firms are likely to be different as the group of HGFs that are active in (high-)growth industries are able to ride the wave of growth of the entire sector. Hence, the fact that these firms could be qualified as a HGF could be attributable to external and industry-specific factors. Explanations for this phenomenon can be found in industrial organization (IO) theories (Waldman and Jensen, 2016; Audretsch, 2018) where a main proposition is that the growth of a firm is to a large extent the consequence of industry membership (Hawawini et al., 2003). For HGFs that could not benefit from being present in a growth industry, the factors explaining the high-growth rates might be found internally, within the resources and capabilities of the firm itself. For this category of HGFs, the link with the resource-based view (RBV) can be made as the main proposition of this theory is that firm growth is strongly dependent on the unique resource bundles that each firm possesses (Barney, 1991).

To summarize, the purpose of this paper is to disentangle the subset of HGFs based on the growth rates of the industries in which HGFs are active and subsequently to identify significant differences in several key characteristics of HGFs that are active in growing versus nongrowing sectors. We believe that the theory of IO and the RBV are the two best suited theories to analyze which type of HGFs are members of a certain type of industry as the IO theory provides the fundamentals for the industry membership focus and the RBV will be used as the theoretical base for our focus on firm characteristics.

The remainder of this paper is structured as followed. First, we will link arguments of the RBV and IO theories to the concept of high firm growth as both theories can explain the potential differences in the type of firms that are realizing high-growth rates. Next, the methods are described. Thereafter, the results of an empirical analysis on a subset of 740 Belgian HGFs for the period 2012–2015 will be presented. Finally, we discuss the results and formulate conclusions as well as potential implications and paths for further research.

2. Theoretical framework

According to O'Regan et al. (2006), the essence of business research is concerned with understanding the factors that contribute to the success and competitive advantage of business organizations. In other words, one could state that one should therefore focus on the question why some firms are more successful and/or grow faster than other firms (Barnett and Burgelman, 1996). In essence, firms that are identified as HGFs should be of particular interest as they can be seen as a sort of best practice for other firms and potential HGFs. McNamara et al. (2003) state that the IO and RBV remain the two main schools of research when analyzing the strategies of successful growth firms. Indeed, both theoretical approaches are considered to reflect a "theory of the firm" and explain why firms exist and most importantly what determines their scale. Especially, this last part of the scope of such theories is particularly relevant in our study focusing on high-growth strategies. In her comparative study, Conner (1991) however claims that one of the main differential factors between IO theories and RBV is the focus on the firm's environment (e.g. industry) in the former while the latter highlighting the internal structure of the firm itself. As such, the fact that we focus on industry membership explains the choice for the theory of IO, and the focus on firm characteristics calls for the RBV as those characteristics are linked to the available financial, human, tangible and intangible resources (Conner, 1991).

The RBV takes the firm as unit of analysis as the resources and capabilities of a firm are seen as the basis for a possible competitive advantage (e.g. Barney, 1995; Peteraf, 1993). In IO theories, the industry becomes the unit of analysis as the assumptions are based on the position of the firm within a specific industry (e.g. McGahan and Porter, 1997). The premise of this paper is that the determinants of high business growth strongly depend on the industry membership of a firm. HGFs present in a growing industry could relate their growth to arguments from IO and HGFs present in a nongrowing industry could relate their growth to RBV arguments. Hence, the paper proceeds with an overview of the key elements of both organizational theories (i.e. RBV and IO) where the focus will be placed on the link with HGFs and the concept of business growth.

2.1 Resource-based view

The main assumption of the RBV is that firms and their performance can differ fundamentally as each firm has its own unique resource bundle. The focus is consequently placed on the internal forces of the firm. The heterogeneous distribution of resources across firms may result

in a competitive advantage in a specific market (Rumelt, 1984). Extreme growth rates can then be the consequence of possessing a superior bundle of resources and/or unique organizational capabilities. Penrose (1959) provided the fundamentals of the RBV with the seminal work “the Theory of the Growth of the Firm.” A firm was defined as a collection of productive resources under administrative coordination and authoritative communication that produces goods and services for sale in the market for profit (Penrose, 1959). It is argued that business growth is induced by the learning process that goes on at the level of the manager. As the manager gets more familiar with his or her tasks, he or she shall be able to perform these in an ever more efficient and productive manner. As a consequence, room is created to swift focus to specific growth opportunities as a result of which the growth of the company can be facilitated (Coad, 2007). Moreover, Penrose (1959) stated that firm growth can arise because of the indivisibility of resources [1] as businesses may grow in order to make use of the part of the resource base that remains unexploited.

The ideas of Penrose (1959) initiated a large number of studies on the importance of firm resources. Building on the assumptions that resources are heterogeneously distributed across firms and the fact that this can lead to differences in the realized growth rates of these firms has led to a focus on the link between firm resources and (sustained) competitive advantage. As to Barney (1991), a firm is said to have a competitive advantage if a value creating strategy is implemented, which is not implemented by a current or potential competitor at the same time. A sustained competitive advantage arises when these competitors are not able to duplicate the benefits of the value creating strategy. Concretely, a firm may obtain a sustained competitive advantage by “implementing strategies that exploit their internal strengths, through responding to environmental opportunities, while neutralizing external threats and avoiding internal weaknesses (Barney, 1991, p. 99).” To have the potential to build up a competitive advantage, a firm’s resource has to be valuable [2] and rare among competitors. Apart from being valuable and rare, it also has to be imperfectly imitable and not easily substitutable for strategically equivalent resources to have the potential for contributing to a sustained competitive advantage (Barney, 1991).

Following this logic, one could state that HGFs that are active in nongrowing industries can contribute this extreme growth rates to a unique bundle of resources, for instance the possession of a unique technology which competitors, growing at a slower rate, do not have, or to the presence of a high-quality human capital base that generates high amounts of added value for the firm.

2.2 *Industrial organization*

Does being present in a certain industry have a strong influence on the chance of being qualified as an HGF? Intuitively, one might expect to encounter a large part of the identified HGFs in (high-)growth industries (Andersson, 2003; Sheppard, 2010), as a booming industry in terms of sales and/or employment growth will be related to strong sales and/or employment growth for its component firms. The success of a firm is then considered to be strongly dependent on industry membership and on the position a firm takes within this industry. Research that departs from an IO perspective considers the industry structure to be an important determinant of firm growth and performance. Differences in firm growth and performance are always considered against an industry background (McGahan and Porter, 1997). Where the RBV departs from the assumption that a competitive advantage was driven by the internal environment of a firm, IO theorists state that industry and external factors are the primary determinants of firm growth and performance [3] (Hawawini et al., 2003).

Research that can be situated in an IO perspective has implicitly adopted two simplifying assumptions (e.g. Barney, 1991). First, firms that are active in a certain industry are assumed to be identical in terms of the resources they possess and the strategies they pursue (e.g. Scherer, 1970; Rumelt, 1984). Second, it is assumed that if resource heterogeneity should exist in an industry, this would be temporary as resources are highly mobile. So, firms are presumed to have the same resources or to have at least the same access to these resources. Therefore, in an IO view, resource heterogeneity and resource immobility are eliminated as possible sources of competitive advantage (Barney, 1991).

According to Michael Porter – one of the most influencing authors in the IO field – every industry has a certain underlying structure or a set of fundamental characteristics that give rise to competitive forces. Back in 1979, Porter identified five forces in his classic HBR article that shaped competition in an industry: customers, suppliers, potential entrants, substitute products and rivalry among existing competitors (Porter, 1979). The extended rivalry that results from these forces shape the industry structure and determine the performance of the industry members. In industries where these forces are intense, very few firms can realize attractive returns on investment. If these forces are mild, high firm performance is made possible for many companies in the industry [4] (Porter, 1979). The strongest competitive force will determine the overall performance of an industry (Porter, 1979). Following this logic, one might expect to encounter a large number HGFs in the subset who are active in industries that

can be characterized by benign industry forces. The strong growth rates of these firms can then be related to these favorable conditions in the external environment of the firm.

In an updated version of his classic article, Porter (2008) stated that it is a common mistake to assume that fast-growing industries are always attractive. Industry growth will tend to reduce rivalry as more opportunities for all industry members would be created. However, high growth may put suppliers in a stronger position and draw in entrants if the entry barriers are low. Porter (2008) also pointed out that some HGFs have been active in the least performing industries. Figure 1 shows that the subset of HGFs could indeed be intuitively split up into HGFs that are active in growth industries and HGFs that are active in nongrowth industries.

3. Methodology

3.1 Sample

We obtained our data from the Belfirst database of Bureau van Dijk (BvD), one of Europe's leading electronic publishers of business information. In line with other growth-related studies (e.g. Dillen et al., 2019; Hölzl, 2014; Bravo-Biosca, 2010), we have used the definition of the Organization for Economic Co-operation and Development (OECD)/Eurostat to extract a sample of HGFs from the large Belfirst database. The OECD and Eurostat defines an HGF as a company that experiences annualized growth rates in employees or turnover greater than 20% per annum over a three-year period with a minimum of ten employees at the beginning of the study period (Eurostat-OECD, 2007). Consequently, a researcher using the OECD/ Eurostat definition can still choose between two growth criteria, depending on the data availability and the research purpose. In this paper, the number of employees was taken as the measure for high growth given the fact that Belgian firms do not have the obligation to publish turnover figures. Thus, in line with Bos and Stam (2013), industry growth was measured as the relative growth in industry employment. In this study, the base year was 2012, and the final year 2015. Additionally, in order to have a sufficient amount of industries (Bos and Stam, 2013; Klapper et al., 2006; Erhardt, 2021), the Level 2 classification of the Statistical Classification of Economic Activities in the European Community, more commonly known as NACE, was adopted. Hence, a total of 85 industries [5] were considered. Appendix gives an overview of the industries and the corresponding number of firms and HGFs.

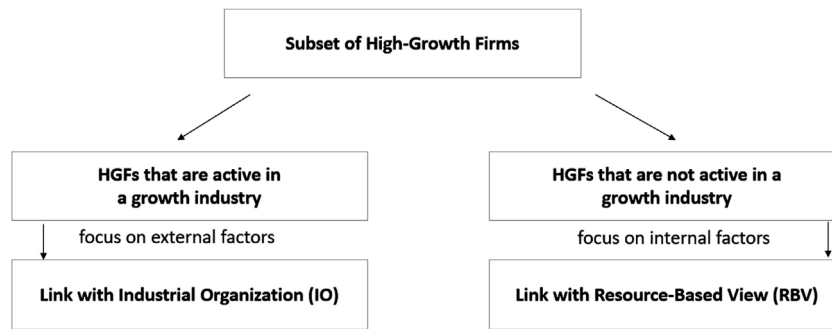


Figure 1. Composition of the subset of HGFs with linkages to IO and RBV

In line with the selected OECD/Eurostat definition of high growth, we opted to use a single three-year time period to identify HGFs. This way, we conform with the time period applied within the definition while also using a generally acknowledged time frame within high-growth research (Daunfeldt and Halvarsson, 2015; Bianchini et al., 2017). Furthermore, we explicitly opted to use only one three-year period as the focus of our study is not to compare cohorts in terms of for example persistency (e.g. Bianchini et al., 2017), but instead we focus on the industry effect within one subsample of HGFs. This approach is similar to other high-growth studies that aimed to isolate specific effects within the same time period instead of comparing HGFs from two different subsamples (e.g. Arrighetti and Lasagni (2013), Coad et al. (2014), Goedhuys and Sleuwaegen (2010), Segarra and Teruel (2014)). As such, for the selected time period 2012 to 2015, 740 Belgian HGFs were identified.

Additionally, a clear demarcation of what is considered a “high-growth industry,” a “growth industry,” a “stable industry” and a “declining industry” is needed. As there are no clear guidelines on the separation between these four types of industries, the following cut-off points were adopted (Table 1). These cut-off points may have a certain level of arbitrariness [6]. The 740 HGFs were classified within their corresponding industry type. Table 2 gives an overview of the number of industries that could be categorized as a high-growth, growth, stable or declining industry. It appears that 35% of the industries had undergone a decrease in total employment in the analyzed period, whereas one out of five industries grew with more than ten percent in terms of total employment. Furthermore, it is shown that 33% of the HGFs were active in one of the high-growth industries, compared to 15% of the HGFs that were present in growth industries. Hence, around 48% of the 740 HGFs were active in – what was defined as – “growing” industries, whereas the remaining part was active in stable (40%) and declining (12%) industries.

High-growth industry	>10% growth in total employment in the period 2012–2015
Growth industry	Between 5% and 10% growth in total employment in the period 2012–2015
Stable industry	Between 0% and 5% growth in total employment in the period 2012–2015
Declining industry	Negative growth in total employment in the period 2012–2015

Table 1. Description of industry types

Industry types	Number of industries that are categorized within this industry type	Relative number	Number of HGFs present in these industries	Relative number
High-growth industry	17	20.00%	243	32.8%
Growth industry	14	16.47%	112	15.1%
Stable industry	24	28.24%	298	40.3%
Declining industry	30	35.29%	87	11.8%
Total	85	100.00%	740	100.00%

Table 2. Distribution of the industries and HGF’s per industry type

Figure 2 summarizes these findings which clearly demonstrate that the subset of HGFs is split into two. With most HGFs being active in high-growth industries (where a link can be made with IO) and stable industries (where a link can be made with the RBV). Referring back to the conceptual framework that was presented above, this “empirical check” makes it clear that the subset of HGFs shows strong heterogeneity when it comes to the growth rates of the industry in which the HGFs are active.

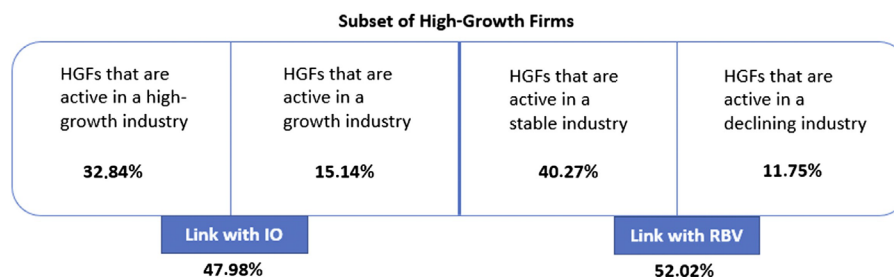


Figure 2. Subset of high-growth firms divided per industry type

3.2 Main constructs

To gain insights into potential differences in the characteristics of HGFs that are active in a high-growth, growth, stable or declining industry, a number of publicly available figures were analyzed for the 740 HGFs. Drawing upon Bianchini et al. (2017), we use four generally acknowledged key drivers of competitive selection and growth. As explained by these authors, it seems “generally plausible that firms having a relative advantage in terms of these four key

drivers should also be more likely to repeatedly experience higher growth over time (2017, p. 640).”

More specifically, the four key drivers, related to structural firm performance dimensions, that are expected to correlate with high growth are as follows: productivity, profitability, innovativeness and financial health. As a proxy for productivity, we used the value added per employee (Bianchini et al., 2017). Furthermore, the return on assets (ROA) ratio for each HGF group (i.e. the four industry types and their “member HGFs”) was calculated as a proxy for profitability (Bianchini et al., 2017). Next, to proxy innovativeness, the book value of intangible assets was taken from the annual accounts (Bianchini et al., 2017; Hall, 1999). Finally, financial health was proxied by taking into account two classic indicators of the financial condition of a firm: the current ratio (as a measure of liquidity) and solvency ratio. With firm age, total assets and the number of FTEs (workforce), three additional constructs were taken into consideration to have a more complete picture of the profile characteristics of the different groups.

4. Results

In conjunction with the descriptive statistics, our data analyses include a Tukey’s range test coupled with a post-hoc ANOVA test. As the goal of our study is to examine between-group differences in several key structural performance dimensions, we use this specific test to enable us to detect statistically significant differences between the (log transformed) mean values of the key constructs between the four different industry types.

Table 3 gives an overview of the descriptive statistics for all constructs, whereas Table 4 shows the mean value (log-transformed) of the constructs per industry type.

	Return on assets	Added value per FTE	Liquidity	Solvency	Firm age	Intangible assets	Total assets	Workforce
<i>N</i>	722	708	709	726	739	431	707	731
Missing	18	32	31	14	1	309	33	9
Mean	3.8	73.1	1.3	26.5	18.3	506.6	12715.0	93.9
SD	16.4	54.8	0.9	26.2	15.1	1066.2	26655.1	152.5
Minimum	-138.5	1.0	0.1	-91.1	0.0	0.0	90.3	2.0
		41.3	0.9		8.0	13.0	1592.3	28.0
P20	3.4	60.0	1.1	23.2	14.0	11.0	4157.1	42.0
P75	8.6	83.8	1.6	42.2	25.0	474.0	9923.8	88.0
Maximum	82.7	459.0	9.3	98.1	110.0	8111.0	180507.3	1431.0

Table 3. Descriptive statistics

	Return on assets *	Added value per FTE	Liquidity	Solvency *	Firm age	Intangible assets	Total assets	Workforce
Declining	1.1	4.2	0.2	24.5	2.6	4.3	8.5	3.8
Stable	3.2	4.2	0.2	27.5	2.8	4.5	8.7	3.9
Growth	3.6	4.0	-0.1	21.9	2.5	4.3	8.4	4.1
High growth	5.7	3.9		28.2	2.4	4.0	7.8	4.1
<i>p</i> (ANOVA)	0.120	<0.001	0.009	0.159	<0.001	0.406	<0.001	0.005
<i>p</i> (Welch)	0.218	<0.001	0.010	0.182	<0.001	0.426	<0.001	0.004

Note(s): * not LOG transformed

Table 4. Means of the descriptive variables on LOG scale and inferential statistics (including robust tests) on effect of sector

Table 5 displays the results of the Tukey's range test in conjunction with the post-hoc ANOVA test. Results show that no significant differences can be found for two out of the four dimensions of structural firm performance that were analyzed. With respect to the profitability and innovativeness of the HGFs that are active in one of the four industry types, it appeared that the mean values of the ROA and amount of intangible assets did not significantly differ from one industry type to another. In other words, HGFs active in – for example – stable industries are not significantly more profitable (or innovative) than HGFs active in growth industries. However, significant differences could be encountered when it comes to the other two dimensions: productivity and financial health. When looking at the added value per employee, the proxy for productivity, it is shown that HGFs active in declining and stable industries are significantly more productive than HGFs active in growth industries and high-growth industries. When looking at the financial health dimension, it can be found that for the liquidity parameter, HGFs active in declining and stable industries have significantly higher liquidity ratios than firms active in growth industries, pointing towards better financial health for HGFs in nongrowing industries. However, for the solvency parameter, no significant differences were identified. For the three additional constructs (i.e. firm age, total assets and workforce), significant differences were found for the following industry types: HGFs in stable industries are significantly older than HGFs in growing industries (both growth and high growth). HGFs active in high-growth industries have significantly less assets than HGFs active in the other three industry types and HGFs active in stable industries employ significantly fewer people than HGFs active in growth and high-growth industries. Figure 3 gives a graphic representation of the mean scores for every industry type.

Dependent variable	(I) sector	(J) sector	Mean difference (I-J)	Std. error	Sig.	Lower Bound	Upper Bound	
Return on assets	Declining	Stable	-2.05329	2.00917	0.737	-7.2270	3.1204	
		Growth	-2.43963	2.35719	0.729	-8.5095	3.6303	
		High growth	-4.56274	2.06505	0.122	-9.8804	0.7549	
	Stable	Declining	2.05329	2.00917	0.737	-3.1204	7.2270	
		Growth	-0.38633	1.83205	0.997	-5.1040	4.3313	
		High growth	-2.50944	1.43683	0.300	-6.2094	1.1905	
	Growth	Declining	2.43963	2.35719	0.729	-3.6303	8.5095	
		Stable	0.38633	1.83205	0.997	-4.3313	5.1040	
		High growth	-2.12311	1.89316	0.676	-6.9981	2.7519	
	Added value per FTE	High growth	Declining	4.56274	2.06505	0.122	-0.7549	9.8804
			Stable	2.50944	1.43683	0.300	-1.1905	6.2094
			Growth	2.12311	1.89316	0.676	-2.7519	6.9981
Declining		Stable	0.02077	0.07701	0.993	-0.1775	0.2191	
		Growth	0.26091*	0.08990	0.020*	0.0294	0.4924	
		High growth	0.29733*	0.07884	0.001*	0.0943	0.5004	
Stable		Declining	-0.02077	0.07701	0.993	0.2191	0.1775	
		Growth	0.24013*	0.06911	0.003*	0.0622	0.4181	
		High growth	0.27656*	0.05395	0.000*	0.1376	0.4155	
Growth		Declining	-0.26091*	0.08990	0.020*	-0.4924	-0.0294	
		Stable	-0.24013*	0.06911	0.003*	-0.4181	-0.0622	
		High growth	0.03643	0.07115	0.956	-0.1468	0.2196	
Liquidity	High growth	Declining	-0.29733*	0.07884	0.001*	-0.5004	-0.0943	
		Stable	-0.27656*	0.05395	0.000*	-0.4155	-0.1376	
		Growth	-0.03643	0.07115	0.956	-0.2196	0.1468	
	Declining	Stable	0.04320	0.07903	0.947	-0.1603	0.2467	
		Growth	0.25790*	0.09183	0.026*	0.0214	0.4944	
		High growth	0.12624	0.08089	0.402	-0.0821	0.3346	
	Stable	Declining	-0.04320	0.07903	0.947	0.2467	0.1603	
		Growth	0.21470*	0.07091	0.014*	0.0321	0.3973	
		High growth	0.08304	0.05603	0.449	-0.0612	0.2273	
	Growth	Declining	-0.25790*	0.09183	0.026*	-0.4944	-0.0214	
		Stable	-0.21470*	0.07091	0.014*	-0.3973	-0.0321	
		High growth	-0.13166	0.07298	0.272	-0.3196	0.0563	
High growth	Declining	-0.12624	0.08089	0.402	-0.3346	0.0821		
	Stable	-0.08304	0.05603	0.449	-0.2273	0.0612		
	Growth	0.13166	0.07298	0.272	-0.0563	0.3196		

Dependent variable	<i>(I)</i> sector	<i>(J)</i> sector	Mean difference (<i>I-J</i>)	Std. error	Sig	95% confidence interval	
						Lower Bound	Upper Bound
Solvency	Declining	Stable	-2.98860	3.20561	0.788	-11.2431	5.2659
		Growth	2.53509	3.77134	0.908	-7.1762	12.2464
		High growth	-3.69310	3.29169	0.676	-12.1693	4.7831
	Stable	Declining	2.98860	3.20561	0.788	-5.2659	11.2431
		Growth	5.52369	2.93229	0.236	-2.0270	13.0744
		High growth	-0.70450	2.28266	0.990	-6.5824	5.1734
	Growth	Declining	-2.53509	3.77134	0.908	-12.2464	7.1762
		Stable	-5.52369	2.93229	0.236	-13.0744	2.0270
		High growth	-6.22819	3.02616	0.168	-14.0206	1.5642
Firm age	High growth	Declining	3.69310	3.29169	0.676	-4.7831	12.1693
		Stable	0.70450	2.28266	0.990	-5.1734	6.5824
		Growth	6.22819	3.02616	0.168	-1.5642	14.0206
	Declining	Stable	-0.20595	0.09052	0.105	-0.4390	0.0271
		Growth	0.14838	0.10607	0.500	-0.1247	0.4215
		High growth	0.22372	0.09279	0.076	-0.0152	0.4626
	Stable	Declining	0.20595	0.09052	0.105	-0.0271	0.4390
		Growth	0.35434*	0.08234	0.000*	0.1423	0.5664
		High growth	0.42967*	0.06433	0.000*	0.2640	0.5953
Growth	Declining	-0.14838	0.10607	0.500	-0.4215	0.1247	
	Stable	-0.35434*	0.08234	0.000*	-0.5664	-0.1423	
	High growth	0.07534	0.08483	0.811	-0.1431	0.2938	
Intangible assets	High growth	Declining	-0.22372	0.09279	0.076	-0.4626	0.0152
		Stable	-0.42967*	0.06433	0.000*	-0.5953	-0.2640
		Growth	-0.07534	0.08483	0.811	-0.2938	0.1431
	Declining	Stable	-0.20489	0.39388	0.954	-1.2208	0.8111
		Growth	-0.00182	0.46399	1.000	-1.1986	1.1950
		High growth	0.26411	0.40851	0.917	-0.7896	1.3178
	Stable	Declining	0.20489	0.39388	0.954	-0.8111	1.2208
		Growth	0.20306	0.35189	0.939	-0.7046	1.1107
		High growth	0.46900	0.27462	0.321	-0.2393	1.1773
Growth	Declining	0.00182	0.46399	1.000	-1.1950	1.1986	
	Stable	-0.20306	0.35189	0.939	-1.1107	0.7046	
	High growth	0.26593	0.36819	0.888	-0.6837	1.2156	
High growth	Declining	-0.26411	0.40851	0.917	-1.3178	0.7896	
	Stable	-0.46900	0.27462	0.321	-1.1773	0.2393	
	Growth	-0.26593	0.36819	0.888	-1.2156	0.6837	

Dependent variable	<i>(I)</i> sector	<i>(J)</i> sector	Mean difference (<i>I-J</i>)	Std. error	Sig.	95% confidence interval	
						Lower Bound	Upper Bound
Total assets	Declining	Stable	-0.11556	0.17414	0.911	-0.5640	0.3329
		Growth	0.13487	0.20325	0.911	-0.3885	0.6583
		High growth	0.71945*	0.17965	0.000*	0.2568	1.1821
	Stable	Declining	0.11556	0.17414	0.911	-0.3329	0.5640
		Growth	0.25042	0.15762	0.386	-0.1555	0.6563
		High growth	0.83501*	0.12572	0.000*	0.5112	1.1588
	Growth	Declining	-0.13487	0.20325	0.911	-0.6583	0.3885
		Stable	-0.25042	0.15762	0.386	-0.6563	0.1555
		High growth	0.58459*	0.16368	0.002*	0.1631	1.0061
Workforce	High growth	Declining	-0.71945*	0.17965	0.000*	-1.1821	-0.2568
		Stable	-0.83501*	0.12572	0.000*	-1.1588	-0.5112
		Growth	-0.58459*	0.16368	0.002*	-1.0061	-0.1631
	Declining	Stable	-0.02197	0.11332	0.997	-0.3138	0.2698
		Growth	-0.29134	0.13327	0.128	-0.6345	0.0518
		High growth	-0.25068	0.11630	0.137	-0.5502	0.0488
	Stable	Declining	0.02197	0.11332	0.997	-0.2698	0.3138
		Growth	-0.26937*	0.10377	0.047*	-0.5366	-0.0022
		High growth	-0.22871*	0.08084	0.025*	-0.4369	-0.0206
Growth	Declining	0.29134	0.13327	0.128	-0.0518	0.6345	
	Stable	0.26937*	0.10377	0.047*	0.0022	0.5366	
	High growth	0.04067	0.10702	0.981	-0.2349	0.3162	
High growth	Declining	0.25068	0.11630	0.137	-0.0488	0.5502	
	Stable	0.22871*	0.08084	0.025*	0.0206	0.4369	
	Growth	-0.04067	0.10702	0.981	-0.3162	0.2349	

Table 5. Tukey's range test (post-hoc ANOVA) for the eight identified variables

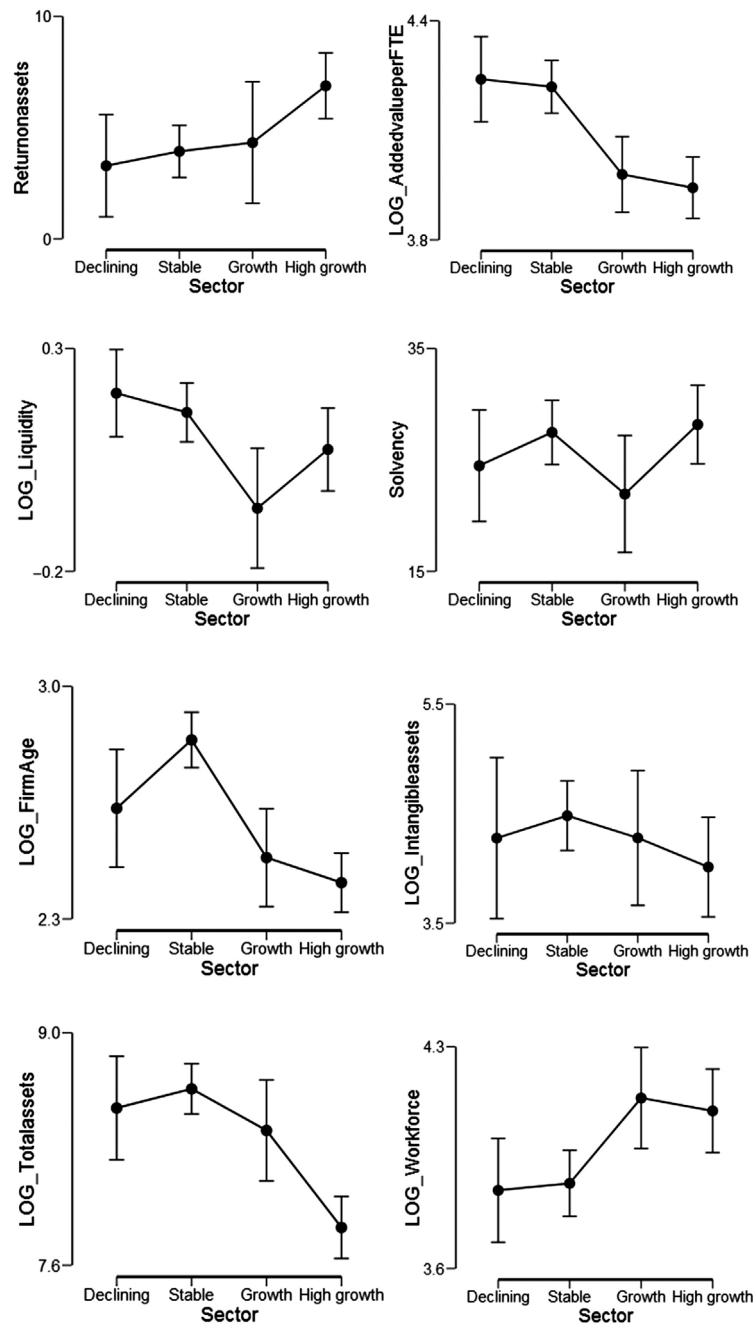


Figure 3. Mean scores per sector with 95% confidence intervals

5. Discussion

Coad et al. (2014) stated some years ago that not much was known about the internal features of HGFs. Notwithstanding the fact that in recent years, some studies (e.g. Bianchini et al., 2017; Bamiatzi and Kirchmaier, 2014; Minola et al., 2017) have emerged that focused on the characteristics of high business growth, the general knowledge about the characteristics of HGFs remains blurred. In a more recent article, Coad and Srhoi (2020) stated that despite the

multiplication of research on firm growth, progress still remains slow, and there is a disappointment with the general ability to predict which firms will realize high growth rates. This might be explained by the fact that until now, many studies have considered the subset of HGFs as a whole. In this paper, we tried to disentangle the subset of HGFs based on the growth rate of the industry in which HGFs are mainly active. In our proposition, a reason for the apparent lack of knowledge may – at least partially – be found in the fact that industry membership plays an important role in determining the characteristics of a high-growth firm.

As to Sheppard (2010), rapid growth – being a rare occurrence – can be seen as the result of the combination of endogenous and exogenous factors. Consequently, a number of environmental and firm-specific factors have to be considered simultaneously in order to explain the phenomenon of high business growth. Put differently, HGFs have to possess not just one prerequisite of growth, but likely a number of complementary characteristics, strategies and resources (Sheppard, 2010). These statements are not disproved in this paper, although, it is highlighted that if one wants to explain high rates of firm growth, the focus should be placed on internal or external factors depending on the industry in which the firm is active. It can be argued that the main reasons for the growth of an HGF that is active in a nongrowth industry can be found inside this firm. Following the RBV logic, this type of HGF will possess a superior resource bundle and capabilities which will provide the basis for the development of competitive advantage. External and industry-specific factors are not considered to be irrelevant for this type of HGFs, though internal and firm-specific conditions are – in accordance with the RBV – seen as the most important drivers of their high growth rates. A similar logic applies to the HGFs who are active in growth industries. For these firms, internal factors will indeed contribute to the strong growth but – in line with the propositions of IO theory – external and industry-specific factors are assumed to be the major stimulus for their high growth rates. Examples of such external factors may be found in governmental subsidies for a certain product or the existence of high-entry barriers within the industry.

The empirical analysis took one subset of Belgian HGFs for the period 2012–2015 as an example to show that half of the HGFs were active in stable and declining industries and the other half were active in (high-)growth industries. The results of the empirical analysis pointed to differences in firm age, firm size, productivity and financial health between the subsets of HGFs that were grouped based on the growth rate of the industry in which they were active. Hence, our research question “Do HGFs that are active in growing industries have different characteristics than HGFs that are active in non-growing industries?” was answered in the

following way. HGFs that were active in stable and declining industries tended to be more productive than HGFs that are active in growth and high-growth industries. This implies that the former type of HGFs realizes more added value per employee than HGFs active in (rapidly) growing industries. This may indeed point to the fact that HGFs in declining and stable industries possess a strong resource base with a workforce with unique capacities as they can realize higher added value per headcount. Also, the fact that HGFs active in declining and stable industries showed a significantly larger amount of assets compared to HGFs active in high-growth industries may endorse the statement that the former type of HGFs relies to a large extent on the firm's resource base to foster the growth of the firm.

Hence, HGFs in nongrowing industries possess a strong resource base with significantly more assets and productive employees that have a higher added value per headcount, whereas this was not the case for HGFs that were active in growing industries. The latter finding provides evidence for the fact that these HGFs were able to ride on the wave of industry growth and did not necessarily benefit from a particularly strong resource base.

Future studies focusing on high-growth determinants may benefit from systematically taking the industry growth rates into account, with the knowledge that the propositions of two different theories – IO and RBV – may be the fundamental drivers of a firm's high-growth rates. The results seem to confirm the conceptual logic that the differences between RBV and IO propositions will have an impact on the drivers of firm performance and high business growth. Future research may look at qualitative research methods that could, for example, carry out in-depth interviews with entrepreneurs of HGFs active in fast-growing industries and entrepreneurs of HGFs active in declining industries to dig deeper into the fundamental differences between these types of HGFs. Questions can be asked such as “What are exactly the superior resource bundles that explain the growth of HGFs in declining industries?” or “What industry forces have played the major role in boosting the industry growth and therefore also the firm's growth rates?.” Hence, every future study that focuses on the growth determinants of HGFs should be aware that considering the subset of HGFs as one homogenous group may be suboptimal as there will always be HGFs that are floating on the wave of industry growth and HGFs that are champions in stable or declining industries. It is likely that the growth determinants of both HGF types will indeed be fundamentally different.

Notes

1. If resources cannot be divided, a firm may have to acquire unnecessary quantities of it (e.g. Moreno and Casillas, 2000).
2. A resource is valuable if it has the potential to exploit opportunities and/or to neutralize threats (Barney, 1991).
3. Although some studies (e.g. Kotha and Nair, 1995) have explicitly measured firm performance in terms of both profitability and sales growth, from an IO perspective, performance is commonly only considered in terms of profitability. It has to be noticed that the strong sales growth of HGFs is not always translated into equally increased profits (e.g. Markman and Gartner, 2002). However, strong gains in sales without regard to profits may be short lived (Porter, 2001). Hence, it can be expected that the lag time that could eventually exist between sales growth and profitability growth will reduce over time (Markman and Gartner, 2002).
4. Porter (2008) states that industries such as airlines and textiles have to deal with intense forces, whereas mild forces characterize industries like software and soft drinks. However, it should be noted that Porter made these statements in a US-based context.
5. Level 2 of the NACE classification has 88 two-digit numerical codes. However, for three sections, no firms could be classified within this section.
6. The cut-off percentages were decided based on a certain degree of arbitrariness. Therefore, a number of robustness checks have been carried out where higher percentages (e.g. > 20% growth to be considered a high-growth industry) and lower percentages (e.g. > 5 % growth to be considered a high-growth industry). Results appear not to change significantly when different thresholds are adopted.

References

- Andersson, S. (2003), "High-growth firms in the Swedish ERP industry", *Journal of Small Business and Enterprise Development*, Vol. 10 No. 2, pp. 180-193.
- Anyadike-Danes, M., Hart, M. and Du, J. (2015), "Firm dynamics and job creation in the United Kingdom: 1988-2013", *International Small Business Journal*, Vol. 33 No. 1, pp. 12-27.
- Arrighetti, A. and Lasagni, A. (2013), "Assessing the determinants of high-growth manufacturing firms in Italy", *International Journal of the Economics of Business*, Vol. 20, pp. 245-267.
- Audretsch, D. (2018), "Industrial organization and the organization of industries: linking industry structure to economic performance", *Review of Industrial Organization*, Vol. 52, pp. 603-620.
- Bamiatzi, V. and Kirchmaier, T. (2014), "Strategies for superior performance under adverse conditions: a focus on small and medium-sized high-growth firms", *International Small Business Journal*, Vol. 32 No. 3, pp. 259-284.
- Barnett, W. and Burgelman, R. (1996), "Evolutionary perspectives on strategy", *Strategic Management Journal*, Vol. 17 No. 2, pp. 5-19.
- Barney, J. (1991), "Firm resources and sustained competitive advantage", *Journal of Management*, Vol. 17 No. 1, pp. 99-120.
- Barney, J. (1995), "Looking inside for competitive advantage", *Academy of Management Executive*, Vol. 9 No. 4, pp. 49-61.
- Bianchini, S., Bottazzi, G. and Tamagni, F. (2017), "What does (not) characterizes high-growth?", *Small Business Economics*, Vol. 48, pp. 633-656.
- Bogas, P. and Barbosa, N. (2014), "High-growth firms: what is the impact of region-specific characteristics?", in Baptista, R. and Leitao, J. (Ed.), *Entrepreneurship, Human Capital and Regional Development*, Springer, Cham, pp. 295-308.
- Bos, J. and Stam, E. (2013), "Gazelles and industry growth: a study of young high-growth firms in The Netherlands", *Industrial and Corporate Change*, Vol. 23 No. 1, pp. 145-169.
- Bravo-Biosca, A. (2010), *Growth Dynamics: Exploring Business Growth and Contraction in Europe and the US*, Research Report, NESTA, London.

Coad, A. (2007), "Firm growth: a survey", Papers on Economics and Evolution, Max Planck Institute of Economics (Evolutionary Economics Group), Jena.

Coad, A. and Srhoj (2020), "Catching Gazelles with a Lasso: big data techniques for the prediction of high-growth firms", *Small Business Economics*, Vol. 55, pp. 541-565, doi: 10.1007/s11187-019-00203-3.

Coad, A., Daunfeldt, S.-O., Höözl, W., Johansson, D. and Nightingale, P. (2014), "High-growth firms: introduction to the special section", *Industrial and Corporate Change*, Vol. 23 No. 1, pp. 91-112.

Coad, A., Segarra, A. and Teruel, M. (2016), "Innovation and firm growth: does firm age play a role?", *Research Policy*, Vol. 45 No. 2, pp. 387-400.

Conner, K. (1991), "A Historical comparison of resource-based theory and five schools of thought within industrial organization economics: do we have a new theory of the firm?", *Journal of Management*, Vol. 17 No. 1, pp. 121-154.

Cooley, T. and Quadrini, V. (2001), "Financial markets and firm dynamics", *American Economic Review*, Vol. 91, pp. 1286-1310.

Daunfeldt, S. and Halvarsson, D. (2015), "Are high-growth firms one-hit wonders? Evidence from Sweden", *Small Business Economics*, Vol. 44 No. 2, pp. 361-383.

Daunfeldt, S.O., Elert, N. and Johansson, D. (2010), "The economic contribution of high-growth firms: do definitions matter", *Ratio Working Papers*, Vol. 151, pp. 1-20.

Daunfeldt, S.-O., Elert, N. and Johansson, D. (2016), "Are high-growth firms overrepresented in high-tech industries?", *Industrial and Corporate Change*, Vol. 25 No. 1, pp. 1-21.

Decker, R., Haltiwanger, J., Jarmin, R. and Miranda, J. (2016), "Where has all the skewness gone? The decline in high-growth (young) firms in the US", *European Research Review*, Vol. 86 No. 1, pp. 4-26.

Delmar, F., Davidsson, P. and Gartner, W. (2003), "Arriving at the high-growth firm", *Journal of Business Venturing*, Vol. 18 No. 2, pp. 189-216.

Delmar, F., McKelvie, A. and Wennberg, K. (2013), "Untangling the relationships among growth, profitability and survival in new firms", *Technovation*, Vol. 33 Nos 8-9, pp. 276-291.

- Dillen, Y., Laveren, E., Martens, R., De Vocht, S. and Van Imschoot, E. (2019), "From Manager to Strategist: an examination of the evolving role of persistent high-growth entrepreneurs", *International Journal of Entrepreneurial Behaviour and Research*, Vol. 25 No. 1, pp. 2-28.
- Dosi, G., Marsili, O., Orsenigo, L. and Salvatore, R. (1995), "Learning, market selection and evolution of industrial structures", *Small Business Economics*, Vol. 7 No. 2, pp. 411-436.
- Erhardt, E.C. (2021), "Measuring the persistence of high firm growth: choices and consequences", *Small Business Economics*, Vol. 56, pp. 451-478, doi: 10.1007/s11187-019-00229-7.
- Ericson, R. and Pakes, A. (1995), "Markov-perfect industry dynamics: a framework for empirical work", *Review of Economic Studies*, Vol. 62, pp. 53-82.
- Eurostat – OECD (2007), *Manual on Business Demography Statistics*, Office for Official Publications of the European Communities, Luxembourg.
- Giner, J.-M., Santa-Maria, M.-J. and Fuster, A. (2016), "High-growth firms: does location matter?", *International Entrepreneurship and Management Journal*, Vol. 13 No. 1, pp. 75-96.
- Goedhuys, M. and Sleuwaegen, L. (2010), "High-growth entrepreneurial firms in Africa: a quantile regression approach", *Small Business Economics*, Vol. 34 No. 1, pp. 31-51.
- Hall, B. (1999), *Innovation and Market Value*, NBER Working Papers 6984, National Bureau of Economic Research.
- Hawawini, G., Verdin, P.J. and Subramanian, G. (2003), "Is performance driven by industry or firm-specific factors? A new look at the evidence", *Strategic Management Journal*, Vol. 24 No. 1, pp. 1-17.
- Henrekson, M. and Johansson, D. (2010), "Gazelles as job creators: a survey and interpretation of the evidence", *Small Business Economics*, Vol. 35 No. 2, pp. 227-244.
- Holzl, W. (2014), "Persistence, survival and growth: a closer look at 20 years of fast-growing firms in Austria", *Industrial and Corporate Change*, Vol. 12 No. 1, pp. 145-163.
- Jovanovic, B. (1982), "Selection and the evolution of industry", *Econometrica*, Vol. 50, pp. 649-670.

Klapper, L., Laeven, L. and Rajan, R. (2006), "Entry regulation as a barrier to entrepreneurship", *Journal of Financial Economics*, Vol. 82 No. 3, pp. 591-629.

Kotha, S. and Nair, A. (1995), "Strategy and environment as determinants of performance: evidence from the Japanese machine tool industry", *Strategic Management Journal*, Vol. 16 No. 7, pp. 497-518.

Li, M., Goetz, S., Partridge, M. and Fleming, D. (2016), "Location determinants of high-growth firms", *Entrepreneurship and Regional Development*, Vol. 28 No. 1, pp. 97-125.

Luttmer, E.G.J. (2007), "Selection, growth and the size distribution of firms", *The Quarterly Journal of Economics*, Vol. 122 No. 4, pp. 1103-1144.

Markman, G. and Gartner, W. (2002), "Is extraordinary growth profitable? A study of inc. 500 high-growth companies", *Entrepreneurship Theory and Practice*, Vol. 27 No. 1, pp. 65-75.

McGahan, A. and Porter, M. (1997), "How much does industry matter, really?", *Strategic Management Journal*, Vol. 18 No. 1, pp. 15-30.

McNamara, G., Deephouse, D. and Luce, R. (2003), "Competitive positioning within and across a strategic group structure: the performance of core, secondary, and solitary firms", *Strategic Management Journal*, Vol. 24 No. 2, pp. 161-181.

Minola, T., Cogliati, G.M., Cassia, L. and Paleari, S. (2017), "Are hyper-growth firms inherently different? Preliminary evidence from a sample of fast-growing European SMEs", *International Journal of Entrepreneurial Venturing*, Vol. 9 No. 2, pp. 122-159.

Moreno, A. and Casillas, J. (2000), "High-growth enterprises (gazelles): a conceptual framework", Paper Presented at the International Conference of the European Academy of Management (EURAM), Stockholm, Sweden.

Moschella, D., Tamagni, F. and Yu, X. (2019), "Persistent high-growth firms in China's manufacturing", *Small Business Economics*, Vol. 52, pp. 573-594.

Navaretti, G., Castellani, D. and Pieri, F. (2014), "Age and firm growth: evidence from three European countries", *Small Business Economics*, Vol. 43 No. 4, pp. 823-837.

O'Regan, N., Ghobadian, A. and Gallear, D. (2006), "In search of the drivers of high growth in manufacturing SMEs", *Technovation*, Vol. 26 No. 1, pp. 30-41.

Penrose, E. (1959), *The Theory of the Growth of the Firm*, Basil Blackwell, Oxford.

- Peteraf, M. (1993), "The cornerstones of competitive advantage: a resource-based view", *Strategic Management Journal*, Vol. 14 No. 3, pp. 179-191.
- Porter, M. (1979), "How competitive forces shape strategy", *Harvard Business Review*, Vol. 57 No. 2, pp. 2-10.
- Porter, M. (2001), "Strategy and the internet", *Harvard Business Review*, Vol. 79 No. 3, pp. 62-78.
- Porter, M. (2008), "The five competitive forces that shape strategy", *Harvard Business Review*, Vol. 86, No. 1, pp. 25-40.
- Rumelt, R. (1984), "Towards a strategic theory of the firm", in Lamb, R. (Ed.), *Competitive Strategic Management*, Prentice-Hall, Englewood Cliffs N.J., pp. 556-570.
- Scherer, F. (1970), *Industrial Market Structure and Economic Performance*, Rand McNally and Company, Chicago.
- Segarra, A. and Teruel, M. (2014), "High-growth firms and innovation: an empirical analysis for Spanish firms", *Small Business Economics*, Vol. 43 No. 4, pp. 805-821.
- Sheppard, M. (2010), *Antecedents of High-Growth and Gazelle Enterprises: An Empirical Study*, Doctoral dissertation, University of Waterloo, Ontario.
- Silverberg, G., Dosi, G. and Orsenigo, L. (1988), "Innovation, diversity and diffusion: a self-organisation model", *Economic Journal*, Vol. 98, pp. 1032-1054.
- Sleuwaegen, L. and Ramboer, S. (2020), "Regional competitiveness and high growth firms in the EU: the creativity premium", *Applied Economics*, Vol. 52 No. 22, pp. 2325-2338, doi: 10.1080/ 00036846.2019.1686454.
- Waldman, D.E. and Jensen, E.J. (2016), *Industrial Organization: Theory and Practice*, Routledge, London.

Appendices

Appendix A: overview of the included NACE industries and their corresponding number of firms and HGFs in the examined period

NACE code	Industry	Number of firms	Number of HGFs
1	Crop and animal production, hunting and related service activities	1435	18
2	Forestry and logging	127	0
3	Fishing and aquaculture	66	0
7	Mining of metal ores	1	1
8	Other mining and quarrying	90	0
9	Mining support service activities	10	0
10	Manufacture of food products	2039	23
11	Manufacture of beverages	107	2
12	Manufacture of tobacco products	11	0
13	Manufacture of textiles	447	5
14	Manufacture of wearing apparel	187	1
15	Manufacture of leather and related products	24	0
16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	488	3
17	Manufacture of paper and paper products	164	2
18	Printing and reproduction of recorded media	752	5
19	Manufacture of coke and refined petroleum products	5	0
20	Manufacture of chemicals and chemical products	389	1
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	76	1
22	Manufacture of rubber and plastic products	394	3
23	Manufacture of other non-metallic mineral products	683	2
24	Manufacture of basic metals	200	17
25	Manufacture of fabricated metal products, except machinery and equipment	2084	0
26	Manufacture of computer, electronic and optical products	180	3
27	Manufacture of electrical equipment	228	2
28	Manufacture of machinery and equipment n.e.c.	769	1
29	Manufacture of motor vehicles, trailers and semi-trailers	156	2
30	Manufacture of other transport equipment	51	1
31	Manufacture of furniture	631	5
32	Other manufacturing	569	0
33	Repair and installation of machinery and equipment	384	3
35	Electricity, gas, steam and air conditioning supply	83	3
36	Water collection, treatment and supply	17	0
37	Sewerage	82	0
38	Waste collection, treatment and disposal activities; materials recovery	387	6
39	Remediation activities and other waste management services	28	0
41	Construction of buildings	3624	13

42	Civil engineering	692	10
43	Specialised construction activities	11821	46
45	Wholesale and retail trade and repair of motor vehicles and motorcycles	4727	11
46	Wholesale trade, except of motor vehicles and motorcycles	11699	92
47	Retail trade, except of motor vehicles and motorcycles	13778	62
49	Land transport and transport via pipelines	3135	34
50	Water transport	82	0
51	Air transport	25	1
52	Warehousing and support activities for transportation	1215	19
53	Postal and courier activities	157	1
55	Accommodation	931	8
56	Food and beverage service activities	6581	18
58	Publishing activities	296	2
59	Motion picture, video and television programme production, sound recording and music publishing activities	304	5
60	Programming and broadcasting activities	27	0
61	Telecommunications	133	4
62	Computer programming, consultancy and related activities	2078	44
63	Information service activities	190	3
64	Financial service activities, except insurance and pension funding	1534	21
65	Insurance, reinsurance and pension funding, except compulsory social security	50	0
66	Activities auxiliary to financial services and insurance activities	3263	9
68	Real estate activities	2293	12
69	Legal and accounting activities	3959	1
70	Activities of head offices; management consultancy activities	2333	30
71	Architectural and engineering activities; technical testing and analysis	1891	21
72	Scientific research and development	138	3
73	Scientific research and development	846	6
74	Other professional, scientific and technical activities	411	3
75	Veterinary activities	136	0
77	Rental and leasing activities	631	2
78	Employment activities	363	31
79	Travel agency, tour operator and other reservation service and related activities	457	1
80	Security and investigation activities	134	9
81	Services to buildings and landscape activities	2116	69
82	Office administrative, office support and other business support activities	1409	28
84	Public administration and defence; compulsory social security	25	0
85	Education	233	1
86	Human health activities	2627	3
87	Residential care activities	474	20

88	Social work activities without accommodation	166	12
90	Creative, arts and entertainment activities	210	1
91	Libraries, archives, museums and other cultural activities	25	0
92	Gambling and betting activities	96	0
93	Sports activities and amusement and recreation activities	786	9
94	Activities of membership organisations	62	0
95	Repair of computers and personal and household goods	163	1
96	Other personal service activities	1978	10
97	Activities of households as employers of domestic personnel	12	0
99	Activities of extraterritorial organisations and bodies	1	0