High-growth firms and scale-ups: a review and research agenda

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Abstract

Purpose – This paper aims to conduct an extensive review and advances a framework for the literature of high-growth firms (HGFs) and scale-ups.

Design/methodology/approach – This paper takes the form of a literature review.

Findings – The author makes three specific contributions. First, he presents a broad review of high growth in firms, shedding light on the different levels of analysis. Second, he advances a characterization of scale-up companies to enable a better basis for discussion. Finally, he identifies gaps in the existing literature and suggest paths for future research.

Originality/value – The interest in HGFs and those referred to as scale-ups has increased considerably in recent years. Despite this trend, existing studies still have conceptual divergences and a gap separating theoretical inputs from the actual experiences of entrepreneurs.

Keywords Entrepreneurship, Start-ups, High-growth firms, Scale-ups

Paper type Literature review

Introduction

In recent years, interest in high-growth firms (HGFs) has increased considerably. Among the various factors that explain this phenomenon, two of them are particularly relevant. On one hand, and especially after the economic crisis of 2008, the creation of jobs has become a prominent theme worldwide. Although HGFs represent only a small portion of the firms in an economy, they are the main ones responsible for job creation (Birch, 1981; Coad *et al.*, 2014; Henrekson and Johansson, 2010; OECD, 2010). For instance, in Brazil HGFs accounted for only about 26,000 companies in 2015 (0.6 per cent of the total), even though the people employed by them increased by 172 per cent between 2012 and 2015, reaching 3.5 million (IBGE, 2017).

On the other hand, but no less important, there is an increasingly accepted understanding that the main challenge for entrepreneurs is not simply starting a business but rather making it grow (Carucci, 2016; Isenberg, 2012). This discussion is significant as it relates to the topics of firm scalability and productivity. Scalability is often associated with a company's ability to grow rapidly without being hindered by the constraints imposed by its structure. This generates positive externalities as the existence of high growth companies can leverage the productivity of an entire industry or region (Bos and Stam, 2014; Bravo-Biosca, 2010, 2011; Du and Temouri, 2015). In this sense, as Brazil is considered as an

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inefficient country (De Negri and Cavalcanti, 2014), an in-depth investigation into the literature regarding HGFs is timely and important.

From the formal point of view, HGFs have been defined in two basic manners (Coad *et al.*, 2014). It can be defined as the percentage of companies in a population that experience the highest growth – e.g. the 10 per cent of companies with the highest growth in a given year. Alternatively, it can be defined as the firms growing at or above a certain rate for an intensive, observable period – e.g. companies that have grown at least 10 per cent per year for two consecutive years. Both definitions are operational in nature, indicating that we still know little about the theoretical compounds that distinguish HGFs. Delmar *et al.* (2003), for instance, identify many distinct types of growth models capable of generating HGFs. Such a variety suggests the absence of a "typical pattern" of growth while inviting a closer look at the phenomenon (Wright and Stigliani, 2012).

As an example, let us imagine a beverage distributor operating in a relatively remote region of Brazil. The firm's growth can be leveraged according to external factors beyond its control. It may be that this distributor operates in a locality that received World Cup soccer matches in 2014. Because of the large influx of investment and tourists, its growth was leveraged like never before; however, after the soccer matches ended, the firm was unable to maintain the rate of growth. Perhaps most importantly, to grow the firm needed to seek new resources (e.g. new trucks), which compromised its profitability. In a similar vein, the December 2016 issue of *The Economist* questions why "Britain has a great record with start-ups, but is less good at producing bigger, more productive companies" (The Economist, 2016). The underlying concern is the extent to which a firm is able to scale efficiently, thereby becoming a *scale-up* company (Assavarujikul and Goodwin, 2014; Coutu, 2014). As I will argue in the subsequent sections, it is the virtuous cycle that links the growth of the firm and wealth creation that differentiates a scale-up company from other HGFs and achieving this cycle is the challenge that entrepreneurs currently face.

This article contributes in three specific directions. First, it integrates the literature about HGFs at its different levels: business environment, organization and individual. This creates a document that brings together the main theoretical and empirical results generated at each level of analysis, thus shedding light on the interdependence between them. Second, the article advances a characterization of scale-up companies to enable a better basis for discussion. Finally, the paper identifies gaps in the existing literature and suggests pathways for future research.

The different levels of analysis

The literature on HGFs has evolved consistently over time, as shown in Figure 1. To analyze this literature rigorously, three sequential steps were performed. First, the maximum number of papers containing at least one of the keywords high-growth firms, gazelles and scale-up was comprehensively searched for using the Pro Quest Dissertations and Theses and Google Scholar tools[1]. This approach enabled the identification of a large number of books, articles and dissertations. The second stage consisted of refining this initial set by identifying only academic articles published in peer-reviewed journals and edited books that report research-based theoretical and empirical arguments. In the third stage, the abstracts of these papers and books were examined. The objective was twofold: to validate the fit of each study to the review and to identify the main recurrent themes. The result of this process was the identification of three distinct levels of analysis regarding HGFs.

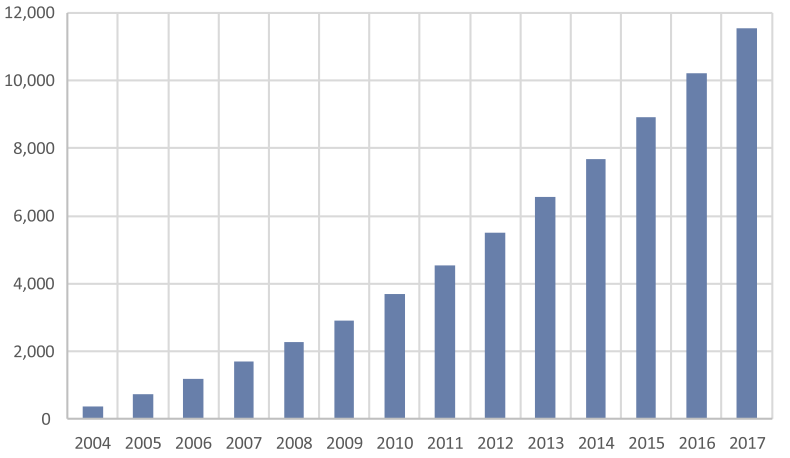

Figure 1.
High-growth firms: number of citations in the academic literature, cumulative evolution, 2004-2017

Source: Google Scholar, elaborated by the author

Business environment

The starting point for the analysis of the relationship between HGFs and the business environment is the finding that the distribution of the growth rate of firms in an economy generally has "heavy tails". That is to say, if we rank companies according to their growth rate, we will have more companies at the extremes of the distribution, thus obtaining an approximately "tent-shape" distribution. This empirical result is robust for different levels of aggregation, different countries and alternative growth measures (Dosi and Nelson, 2010). Within this scenario, two subjects are prominent in the literature: the generation of jobs and the productivity growth of the economy.

One of the main sources of interest in HGFs, if not the main one, is the fact that these companies play an important role in the generation of jobs (Acs *et al.*, 2008; Acs and Mueller, 2007; Anyadike-Danes *et al.*, 2009; Birch and Medoff, 1994; Brüderl and Preisendörfer, 2000; Davidsson and Henrekson, 2002; Delmar *et al.*, 2003; Halabisky *et al.*, 2006; Littunen and Tohmo, 2003). This result was initially obtained by Birch (1981) in the USA. The author found evidence of a dynamic process in which large firms have a higher proportion of job destruction, while small, growing companies are the main creators of jobs. Although this result is not immune to criticism (Brown *et al.*, 1990; Davis *et al.*, 1996; Haltiwanger *et al.*, 2013; Neumark *et al.*, 2011), there is currently a consensus that a few HGFs in a given economy are responsible for a large fraction of the new jobs.

A second source of interest in HGFs relates to the issue of productivity. In a simplified way, productivity means efficiency in the use of resources applied in production. From the economic point of view, this is the amount of output obtained from a given set of inputs. It is known that entrepreneurship has a stable, significant impact on the productivity growth of an economy (Erken *et al.*, 2016), and it is a relevant explanatory factor for a country's performance (Davidsson and Henrekson, 2002)[2]. Specifically, in the case of HGFs, evidence indicates that a larger number of HGFs is associated with greater future industry growth (Bos and Stam, 2014). There is also evidence of a virtuous cycle between productivity and high growth: firms with high productivity are more likely to grow faster in sales, while HGFs are more likely to achieve high productivity growth (Du and Temouri, 2015).

In a more general sense, there is a positive relationship between the productivity growth of the economy and the dynamism of firms' growth rates (Bravo-Biosca, 2010, 2011). This means that the economy becomes more productive when the ranking of firms evolves with time. This configuration reveals an ever-changing business environment, with ideas (and companies) arising and growing in an accelerated and continuous manner. Conversely, the higher the percentage is of firms that remain static, the lower the productivity growth. Interestingly, the same outcome is observed in the case of job creation. For example, Daunfeldt and Halvarsson (2015) note that in Sweden the firms with the highest job losses in a period are the most likely to become HGFs in terms of job creation in the following period. On the other hand, firms with zero growth are more likely to remain in the same situation in the subsequent period.

Although this parallelism between productivity and employment may sound natural, it actually involves a non-trivial issue. There is a trade-off when defining HGFs in terms of job growth or increased productivity. To be precise, when we define HGFs in terms of employment, the group of firms is different from that obtained when we define HGFs in terms of productivity, and the economic contributions of each group differ significantly (Daunfeldt *et al.*, 2014). The consequences of this can be puzzling. Let us imagine, for example, a public policy focused on job creation through incentives to HGFs. The trade-off described above tells us that such a policy, when successful, can generate a negative and unintended effect on the productivity of the economy.

In the main, the discussion focused on the business environment is relevant in that it allows us to contemplate the aggregate movement of macroeconomic variables and how they influence and are influenced by HGFs. However, one should not lose sight of the fact that an HGF is simply a company that seeks to gain and sustain competitive advantage. For this reason, at the next level, the high-growth firm is examined in more detail.

Organization

The most intuitive way to introduce this second level of analysis is to consider the generic trajectory of an HGF, as described in Figure 2. The trajectory is separated into four main phases. The first is informally called the "valley of death", indicating the period of time between the receipt of venture capital funding by a company and the establishment of a positive and stable cash flow. After passing through this initial phase, an HGF generally encounters a trigger point. Brown and Mawson (2013) define this point as a systemic change

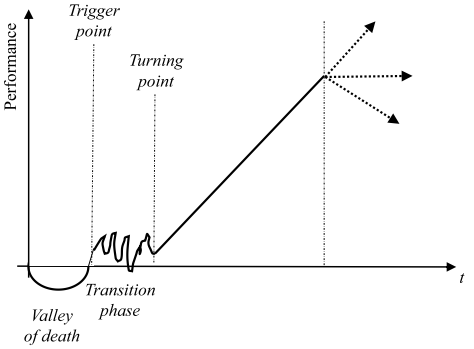

Figure 2.
Generic trajectory of an HGF

in the structure and functioning of a firm, which provides a critical opportunity to change its growth trajectory.

Many factors can set off a trigger point (Brown and Mawson, 2013), which is to say that firms can grow for several different reasons (Hölz and Friesenbichler, 2008). These include exogenous factors, such as market opportunities, and endogenous factors, such as innovation. In this specific regard, Holzl (2009) found evidence that innovation, measured in terms of research and development (R&D), is more important for the growth of firms the closer an economy is to the technological frontier. However, contrary to the conventional wisdom, HGFs are not necessarily synonymous with high-tech firms (Brännback *et al.*, 2010). Daunfeldt *et al.* (2016) observed that the intensity of R&D has a negative or zero effect on the proportion of HGFs in a given industry. According to the authors, knowledge-intensive industries are more likely to have a higher proportion of HGFs. In other words, it is human capital, not R&D, that plays a relevant role in explaining the non-uniform distribution of the growth rate of firms in the economy (Klette and Kortum, 2004; Rossi-Hansberg and Wright, 2007). An example is the company *Beleza Natural* [Natural Beauty], headquartered in Rio de Janeiro. The company provides hair care products and treatments focused on afro-descendent women. Although it does not have an intensive technological base, the company has shown an exponential growth mainly due to its innovative product application process, which resembles a factory production line.

The trigger point marks the beginning of a transition phase, in which the firm seeks to adjust dynamically to its new challenges. Strictly speaking, there is no minimum period of time that the firm remains in the transition phase – although the "wear and tear" generated by the turbulence that is characteristic of this phase indicates that the firm cannot remain there indefinitely. In the end, the firm reaches a turning point (Brown and Mawson, 2013) that can usher in a phase of accelerated growth, which gives the firm the status of an HGF.

Although the growth period should represent an "observable and fundamental" period in which the firm consolidates in the market, it tends not to persist indefinitely (Coad *et al.*, 2013; Holzl, 2014). On the contrary, a high growth rate can occur for a given period and not be repeated over the life of the firm (Daunfeldt and Halvarsson, 2015)[3]. The Brazilian 99 taxi app is an example. After a vertiginous period of high growth, the company stabilized until a foreign competitor acquired it. There are some who observe this phenomenon in a structural manner, suggesting that there is a reduction in the ability of firms to systematically and meaningfully obtain scale, even though the number of new ideas and the potential for innovation have grown in recent years (Guzman and Stern, 2017). This idea opens space for a number of possible hypotheses about the reason for the non-persistence of high growth.

A first hypothesis is to argue that growth of the firm is a purely random effect and therefore can neither persist nor have a correlation structure (Daunfeldt and Halvarsson, 2015; Denrell and Liu, 2012)[4]. According to this line of reasoning, the group of firms (and entrepreneurs), in addition to external contingencies, is random, such that there is no possibility for sequential construction of growth. A second hypothesis is that high growth rates are naturally followed by a period of stagnation. A firm may experience inefficiency after a period of rapid expansion owing to an inability to adjust its management and other resources in time to address the organizational complexities typically associated with periods of rapid growth (Du and Temouri, 2015)[5]. Correspondingly, a third hypothesis is that past growth serves as a constraint on future growth as the firm develops organizational rigidity and path dependence (Baker and Cullen, 1993). Finally, a fourth hypothesis is that a firm's high growth is limited by the market power of incumbent firms (Surowiecki, 2016). In this scenario, the companies established in the market tend to react to a firm's growth

through, for example, price wars or strategic commitments (Mascollel *et al.*, 1995; Osborne and Rubinstein, 1994). The basic intention is to preserve their competitive position, thus preventing the HGF from increasing its market share.

Obviously, the success of an incumbent company in disturbing a firm's growth is not guaranteed. If, for instance, an HGF bases its business model on a disruptive technology (Christensen, 1997), there is a strong chance that the established companies will not be able to significantly affect the HGF's growth trajectory. This only shed light on a trivial fact: firms in a given market establish a competitive equilibrium, which is defined dynamically by the meeting of their different strategies. Specifically, in the case of HGFs, the available evidence indicates that the most common strategy is to innovate to improve product quality and customer satisfaction, not necessarily to reduce costs. This, in turn, requires more frequent, personalized contact with customers to identify consumer needs. In other words, the HGF strategy tends to be more market oriented (OECD, 2010) and focused on a product niche (Corbett and Campbell-Hunt, 2002).

At the end of the day, however, it is always important to remember that a firm does not represent a simple aggregation of productive factors. Individuals and their behavioral dynamics shape organizations and fundamentally influence their performance. This brings us to the next level of analysis of HGFs.

Individual

The individual represents the third level of analysis. Specifically, the HGF literature has devoted attention to the central theme of the change in the entrepreneur's role in the different development phases of an HGF.

In the early stages of an enterprise, the individual plays a key role in defining and redefining the business model. This stage is a dynamic period of high uncertainty, in which the entrepreneur must estimate the whole group of productive operations. This task is intrinsically difficult, given that it is impossible to predict exactly the future outcome of a productive activity, the future demand that one intends to satisfy and the future outcomes of the operation, including the direction of technology and control of output. This is what shapes entrepreneurial action, meaning the exercise of judgment regarding scarce resources in uncertain conditions, with the intention of satisfying potential future preferences (Foss and Klein, 2012; Knight, 1921). If, in addition, the individual has a growth ambition (Barringer *et al.*, 2005; Delmar and Wiklund, 2008), this is the starting point for an HGF.

It is evident that in the event that a firm effectively gains momentum and grows rapidly (i.e. moving from the "turning point" in Figure 2), a need for significant changes in its organizational capabilities naturally arises (Moreno and Casillas, 2007). In particular, the firm must refine its marketing capabilities (Barbero *et al.*, 2011; Parker *et al.*, 2010), financial capabilities (Barbero *et al.*, 2011), human capital development (Lopez-Garcia and Puente, 2012) and research and innovation strategies (Colombelli *et al.*, 2014). Most importantly, the entrepreneur must rethink his or her role within the organization.

Because resources must be appropriately used to enable high growth (Pettus, 2001), it is necessary for the entrepreneur to restructure the organization by designing more formalized processes that have greater hierarchical control (Sirmon *et al.*, 2011). The entrepreneur must also change his or her behavior, such as by learning to work with more employees and continuously improve processes (OECD, 2010). Obviously, how the entrepreneur approaches this transition is important for achieving high growth itself (Covin and Slevin, 1997). Not surprisingly, among the main obstacles for firms in periods of high growth is a lack of managerial skills, together with shortages of skilled labor and cash flow problems (Lee, 2014).

Where are the scale-ups?

Up to this point, the discussion has been focused exclusively on HGFs, without an explicit mention of their relationship to scale-up companies. The reason is simple: there is not yet a precise definition of scale-ups in the literature. Consequently, the current debate about the subject tends to be confusing. Much of this confusion stems from the fact that any scale-up is an HGF, but not every HGF is a scale-up. This aspect is relevant and deserves more attention.

A good starting point for understanding the idea of scale-ups is the concept of strategic entrepreneurship, which is the combination, by the firm, of effective opportunity-seeking behavior with effective advantage-seeking behavior to create wealth (Hitt *et al.*, 2001; Ireland, *et al.*, 2001, 2003; Kuratko and Audretsch, 2009). Whereas the search for opportunities represents entrepreneurship in its essence, the pursuit of advantages is related to strategy. Specifically, strategy is understood here as the combination of two distinct elements: a set of resources and activities and a market positioning (Nickerson *et al.*, 2001). The firm's resources and activities represent its business model. Positioning, on the other hand, is the manner in which a firm chooses to act against competitors in its market space. This involves, for example, decisions on price, quality and timing of market entry (Zott and Amit, 2008).

As has been argued previously, in the initial stage, the entrepreneur plays a prominent role in the (re)design of the firm's business model (first component of strategy). The entrepreneur engages in what Sirmon *et al.* (2011) describe as resource-structuring behaviors. After this initial phase, and once again assuming that the firm has passed the "turning point" (Figure 2), a period of growth may begin. Particularly relevant, however, is the fact that a firm's growth is interrelated with the entrepreneur's wealth creation. Ireland *et al.* (2003) describe a virtuous cycle in which the firm's effective growth – whether through market power or economies of scale – enables the creation of wealth, which, in turn, allows the firm to allocate resources to stimulate its own growth (see Figure 3).

According to this logic, an HGF can be defined as any firm that has, for an observable and fundamental period, an accelerated cycle of growth and wealth creation. From an empirical perspective, in accordance with the OECD-Eurostat Manual on Business Demography Statistics (2007), companies with more than 10 employees that have grown at least 20 per cent a year for at least three consecutive years (in number of employees or revenue) are included in this category. If, in addition, a company is at least five years old, it is known as a "gazelle".

It is worth emphasizing that the growth of an HGF can be based on both market power and obtaining economies of scale. Market power is related to the idea of market positioning, and it is commonly understood as a firm's ability to raise prices above the competitive level without a significant portion of its business being immediately redirected to rival firms. In other words, it is the power to profitably raise the price above the competitive level. This can

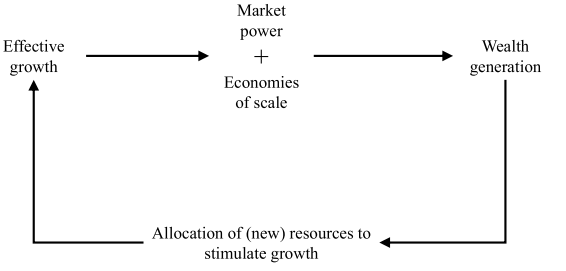

Figure 3.
Cycle of growth and wealth creation

occur, for example, when the firm is successful in establishing a brand that is recognized and desired by consumers.

In the case of economies of scale, growth is driven by reducing the firm's average cost as its output increases. This occurs when the business model presents a potential for scalability. What exactly does this mean? In general, we know that a firm builds a business model with the objective of exploiting a market opportunity, thus creating value for the parties involved. The business model itself can be understood as an interdependent system of resource and activities, which are centered on the firm itself. The role of the firm is central because the activities necessary for the creation of value – in the economic and technological sense – are connected and therefore must be coordinated. This brings us to the other side of the coin. A business model can also be defined by the content, structure and governance of the transactions designed to create value by exploiting business opportunities (Zott and Amit, 2010, 2013; Zott *et al.*, 2011). Consequently, a scalable business model is one that is characterized by activities or transactions that can be replicated in such a manner that the firm is able to increase its revenue at a rate faster than its costs, thus gaining scale.

As a result, a scale-up can be defined as an HGF whose accelerated cycle of growth and wealth creation is fundamentally based on the scalability of its business model. This does not mean that a scale-up company never has market power, e.g. through building a strong brand. The point to be emphasized is that the growth of the firm is based, essentially but not exclusively, on the scalability of its business model. This distinction is relevant insofar as the firm's growth based on market power alone tends to be limited and, in some cases, inefficient (Williamson, 1991).

Looking forward

By shedding light on the different levels of analysis of HGFs and developing a more precise characterization of scale-ups, a number of questions naturally arise. Such questions can be organized around a few research fronts that together outline a research agenda.

The measurement question

Once a theoretically more accurate characterization of scale-up companies is proposed, the issue of measurement spontaneously gains relevance, bringing with it important challenges. To make this issue clearer, let us return to the example described in the introduction of this article about the beverage distributor in the countryside of Brazil. It may be that when applying the operational definition of the OECD-Eurostat, the firm has been growing at an average rate of 20 per cent per year for three consecutive years. Therefore, the company is included in the group of HGFs. However, it is not necessarily a scale-up. The beverage distributor does not fall into this category if it grew simply because it was the only company able to serve the local market in the face of increased demand, but its business model is not sufficiently scalable to sustain growth.

Although the above example is simple, it sheds light on a central point. In developing empirical analyses of HGFs, what are we effectively capturing? Put differently, do the studies listed in the third section of this article base their conclusions on beverage distributors? There is nothing wrong with analyzing HGFs and their dynamics. What is less correct is if one "mistakes the part for the whole". It cannot be said that all HGFs base their growth on efficient, scalable business models, and from these are derived the public policy recommendations that focus on scale-ups.

Empirical operationalization

Besides the measurement issue, each of the levels of analysis as described in Section 2 may be associated with major theoretical traditions, which in turn may be useful in the future empirical operationalization of HFGs and scale-ups. In the case of business environment, the New Institutional Economics (North, 1990) may provide important inputs for the study of the influence of the institutional environment on the emergence and performance of HGFs. The Resource Dependence Theory (Davis and Adam Cobb, 2010) may also provide valuable insights into how HGFs and scale-ups engage in transactions with other actors in their environment to acquire the resources needed for their growth. Another interesting line of research involves investigating firm growth and entrepreneurial activity from a geographical perspective, taking into account the historical background of a given region (Glaeser *et al.*, 2015) or the existence of agglomeration spillovers (Greenstone *et al.*, 2010).

When analyzing high growth from the perspective of the organizations, the resource-based view (Barney, 1991; Peteraf, 1993) and the dynamic capabilities approach (Teece *et al.*, 1997) may point out interesting ways for more precise characterization of the way in which companies are able to grow in an accelerated manner. The behavioral theory of the firm (Cyert and March, 1963; Levitt and March, 1988), on the other hand, can help us better understand the process of growth, where the HGF ceases to be a small unit operated by the entrepreneur and becomes a large enterprise formed by coalitions of individuals and groups.

Finally, from the perspective of the individual, entrepreneurship literature can provide us with elements to advance the understanding of individuals who lead high-growth companies (Foss *et al.*, 2007; Foss and Klein, 2012), especially in emerging economies (Bruton *et al.*, 2013).

Positive and negative growth

An interesting result from the HGF literature is the finding of a positive relationship between the productivity growth of the economy and the dynamism of the distribution of the growth rates of firms (Bravo-Biosca, 2010, 2011). This suggests a sequence of events in which, at a given instant of time, HGFs become companies with negative growth in the next instant, being replaced by firms that were not growing previously. Despite these underlying forces being empirically relevant, virtually all of the studies that make a link between productivity and the growth rate of firms favor the "positive" side. Companies at the extreme opposite of the growth distribution (i.e. firms with negative growth rates) have not yet received the necessary attention (Coad *et al.*, 2014). In other words, we still need to advance in the study of high “de-growth” companies.

The role of the ecosystem

The entrepreneurial ecosystem has a relevant role in the performance of firms, especially in their initial stage. This is particularly critical in the case of HGFs and scale-ups because these firms tend to be characterized by an intense, abrupt demand for resources that support their growth. For no other reason, small HGFs are involved in a variety of networks and alliances to address their resource constraints, especially amidst the pressure of internationalization (Chetty and Campbell-Hunt, 2003; Mohr *et al.*, 2014).

However, an HGF’s demand for resources is not limited to the forging of external alliances. The hiring and training of employees is another key issue, especially when considering that HGFs are most prevalent in knowledge-intensive industries (Daunfeldt *et al.*, 2016). It is precisely for this reason that the result obtained by Coad *et al.* (2014) – that HGFs hire lower-skilled workers – is a source of surprise. This result is counterintuitive and therefore deserves further investigation.

Also, regarding obtaining resources it is known that boards of directors increase the absorptive capacity of firms that are moving beyond their initial stage of development. These boards complement the firm's human capital in two aspects: by serving as a source of information, experience and networking and by providing mentoring to senior managers (Zahra *et al.*, 2009). Specifically, in relation to mentoring little is currently known about how this process occurs in HGFs and scale-ups. Studies along these lines could lead to interesting insights about the key challenges perceived by the entrepreneurs (and the mentors) and how they are addressed.

Finally, an emerging theme in the literature is what Wasserman (2017) calls a "control dilemma". According to this dilemma, a start-up's resource dependence leads to a trade-off between the value of the firm and the entrepreneur's ability to maintain control over decision-making. The more valuable a resource that the firm needs but does not have, the greater the control that the entrepreneur must yield to the holder of the resource. Wasserman (2017) found evidence that start-ups in which the founder maintains some sort of control are characterized by significantly lower valuations compared with start-ups in which the founder relinquishes control. An interesting question that then arises is to understand the dynamics of the control dilemma in HGFs and scale-ups.

Public policy

It is somehow intuitive to claim that policymakers can define scale-up support measures if they are able to understand the conditions that generate high growth in firms and the channels through which such firms contribute to the dynamics of economic growth. An intrinsic difficulty in this type of argument, however, is that the traditional forms of support tend to have little value in the case of HGFs. Mason and Brown (2013) identified three major criticisms of existing public policies focused on HGFs and scale-ups. First, policies are based on the assumption that technology sectors are the main source of HGFs and that technology firms are more likely to grow. Second, policies tend to be based on the (misguided) idea that HGFs are typically recent start-ups. Third, public policies are designed considering that the industrial manufacturing sector is a significant source of HGFs. A fourth criticism that can be formulated relates to the fact that high-growth events do not persist, i.e. HGFs are one-hit wonders. Consequently, the idea that public policy can rely on the past growth of HGFs to predict their future growth is weakened (Coad *et al.*, 2014; Daunfeldt and Halvarsson, 2015).

Yet, not all is lost. If it is possible to relate dynamism in the growth rates of firms with institutional elements, there is a method to discuss public policies (Coad *et al.*, 2014). For example, Bravo-Biosca *et al.* (2013) observed that a country's financial development and the level of banking competition and contractual enforcement are associated with a more dynamic business environment. On the other hand, Brown and Mawson (2016) observed that the type of support provided to start-ups differs from that required for scale-ups. For this type of firm, it is more relevant to provide assistance in the form of business mentoring, guidance for obtaining venture capital and intellectual property protection, among other things, which are adjusted according to the local environment. Although these arguments are relevant, the public policy discussion needs to advance considerably.

Conclusions

Research on HGFs and scale-ups in the Brazilian context is still in its early stages. We know little about these companies apart from a few descriptive, time-lagged statistics[6]. Who are these companies? What are the main characteristics of the entrepreneurs who lead these firms? How do the Brazilian and regional business environment affect these firms? These questions – and many others – still need to be investigated rigorously. The importance of

this research effort is evident. High growth companies are those that pull a country's productivity up, and Brazil is a remarkably inefficient country.

Based on this challenge, the present article elaborated an in-depth investigation of the HGF literature and contributed in three specific aspects. First, a broad review of the literature on HGFs was performed, identifying the different levels of analysis (economic environment, organization and individual). Second, a more precise characterization of scale-up companies was proposed to enable a better basis for discussions. Finally, gaps in the existing literature were identified, thereby suggesting pathways for future research.

Notes

1. Term applied for the identification of young HGFs.
2. Erken *et al.* (2016) measured entrepreneurship as the rate of ownership of companies (number of entrepreneurs per number of employees) corrected for economic development (GDP per capita).
3. This point is particularly relevant because it suggests that HGFs do not represent a natural state but are rather a transitory state, which may or may not be prolonged and may occur more than once in the life of a company, although there is still no empirical evidence that conclusively supports this theory.
4. This argument is known as Gibrat's Law or the Law of Proportionate Effect.
5. The term "Penrose Effect" is normally used to describe this challenge in terms of managerial skills and technology absorption. See Penrose (1959) and Garnsey, Stam & Heffernan (2006).
6. IBGE releases aggregate data on HGFs with two years of lag.

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