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Contents

Policies for Scaling Up Technology-Based Firms

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ABSTRACT

This study focuses on the scale up issue, which is crucial for numerous countries. The reason for policies in firms that want and have the opportunity to scale up their business is that these firms have a large potential to create job opportunities and economic development compared to investment in startups without any growth ambitions. The overall objective is therefore to study policies to facilitate technology-based firms' scaling up. As a consequence of earlier research on high-growth firms, little attention has been paid to surviving and stable firms that may want to scale up. This study design comprises three main empirical areas: financial support, framework conditions and innovation systems. The first contribution of this study is that it is an empirical description of policies at the country level to support technology-based firms. The study also develops a conceptual model for evaluating policies to promote technology-based firms. The model consists of three dimensions: perspectives/actors, analysis, and evaluation. The results provide insights into (i) how policymakers can better examine crucial links between the scaleup populations and demand side policies and (ii) how policymakers can better comprehend the linkages between the three dimensions to evaluate policies.

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Keywords: Policies; scaling up; scaleups; high-growth firms; technology-based firms.

1

Introduction

1.1 Background

Policies that support high-growth technology-based firms are worthwhile because there is empirical evidence for the importance of high-growth firms for employment creation and other values. It is expedient to identify and support firms that want to scale up to leverage the positive impact of these firms. According to the OECD (2013), 4%–6% of high-growth firms create 50%–75% of all new jobs. While only a limited number of small and medium-sized enterprises (SMEs) manage to achieve substantial growth, these select fast-growing firms play a pivotal role in generating new jobs across OECD economies (OECD, 2021). Moreover, the positive effects of these high-growth firms are not limited to new employment. The firms also contribute to higher productivity, are export-oriented, and contribute to the growth of other firms and regions (Kolar, 2014). Therefore, the reason for policies for firms that want to scale up their businesses is that these firms have a large potential to create job opportunities compared to investing in startups without any growth ambitions (Shane, 2009; Mason and Brown, 2013). There is some empirical evidence that high-growth firms are pivotal in the development of the economy (Acs and Mueller, 2008).

In recent decades, interest in high-growth firms has increased significantly (Birch, 1981; Davidsson and Henrekson, 2002; Delmar *et al.*, 2003; Halabisky *et al.*, 2006; Acs and Mueller, 2008; Acs *et al.*, 2008; Henrekson and Johansson, 2010; OECD, 2010; Brown and Mawson, 2013, 2016; Coad *et al.*, 2014; Monteiro, 2019; Rannikko *et al.*, 2019). Previous studies have demonstrated that high-growth firms can effect an immense supplement of jobs (Storey and Tether, 1998; Spencer and Kirchhoff, 2006), and a small share of the firms create a major part of new employment opportunities (Storey, 1994; Machado and Wilson, 2014; Bravo Biosca, 2010; Hallak and Harasztosi, 2019). The firms tend to be young but not necessarily small (Coad *et al.*, 2018), and the high-growth firms are represented in all sectors (Henrekson and Johansson, 2010). However, a firm's high growth is not a consistent situation (Goswami *et al.*, 2019), but can be sustainable on a regional level (Friesenbichler and Hölzl, 2020). Numerous high-growth firms are a driving force in innovation (Machado and Wilson, 2014), but a majority of the firms do not grow at all or have low growth. However, high-growth firms enjoy special attention in policy contexts because the firms create numerous new jobs.

For high-growth firms, most definitions regarding minimum growth requirements are developed by central organizations such as the OECD (Organization for Economic Cooperation and Development) and the EU (European Union). As the term "*scaleup*" suggests, such a firm is an organization that started as a startup and has grown while changing its size or scale. This implies that the startup has succeeded in using and commercializing its business model and industrializing it, thus demonstrating the firm's viability. Scaleup is nothing more than a successful startup. A firm will either go bankrupt, be acquired/merged with another firm, or evolve into a scaleup. To enable a firm to become a scaleup, the organization should have international ambitions to expand its market. According to Monteiro (2019), a scaleup primarily drives its growth by developing its business model rather than achieving breakthroughs solely through market power. A high-growth firm (Coad *et al.*, 2014) can be defined as either the top 10% with the highest growth in a single year or firms that have grown at least 10% over two years. A scaleup must have a minimum of ten employees at the starting

year or when the assessment of the firm as a scaleup begins. Every high-growth firm with at least ten employees is a scaleup, but not every scaleup is a high-growth firm owing to the higher minimum employee threshold for scaleups and the slightly higher growth requirements for high-growth firms.

1.2 Research Question

The question thus arises as to the need to distinguish high-growth firms from scaleups. According to the Monteiro (2019), the concept of "strategic entrepreneurship" is central in this context, which combines opportunity-seeking behavior with effective advantage-seeking behavior to create prosperity (Hitt *et al.*, 2001; Kuratko and Audretsch, 2009). Strategy here is a blend of resources and market positioning (Nickerson *et al.*, 2001), where resources constitute the business model. The entrepreneur acts as an allocator of resources within the firm (Sirmon *et al.*, 2011). Ireland *et al.* (2003) describe a firm's growth, either created through market positions or economies of scale, as enabling wealth and, in turn, facilitating the firm's ongoing growth.

To scale up, a firm essentially has three different choices: (1) remain a private firm without going public, (2) go public through an IPO (Initial Public Offering), or (3) get acquired. The second option involves accessing "cheap" capital, but an IPO also entails shareholder expectations for performance and shorter time horizons through quarterly reports (Bernstein, 2015; Asker *et al.*, 2016). The third option involves merging or being acquired by another firm, which can completely alter the growth trajectory. Ultimately, the strategic focus the firm chooses to adopt determines which of the three alternatives it selects. In this context, Monteiro (2019) emphasize that growth can occur randomly, making it difficult to construct a universally applicable model for a firm's growth. Certain growth periods are also accompanied by periods of growth stagnation, possibly due to challenges in allocating resources effectively (Du and Temouri, 2015).

Baker and Cullen (1993) suggest that prior growth can hinder continued growth, as firms develop rigidity in their actions. According to the OECD (2010), firms tend to be more market-oriented and focused on

a specific type of product (Corbett and Campbell-Hunt, 2002). As a firm expands, it becomes evident that the firm must enhance its marketing resources, financial capabilities, human capital, and innovation strategies. The firm must develop its governance as it grows to attain control (Covin and Slevin, 1997; Löfsten and Lindelöf, 2002, 2003; Pettus, 2001; Sirmon *et al.*, 2011; Lee, 2014; Löfsten, 2016; Rannikko *et al.*, 2022). Internal and external factors contribute to the development of high-growth firms and scaleups, and an external factor can, apart from market opportunities, also be a country's policies and support for businesses.

Policies for high-growth firms are often directed to R&D-intensive sectors, although Daunfeldt *et al.* (2016) discovered that high-growth firms were underrepresented in R&D-intensive sectors and overrepresented in knowledge-intensive sectors. Policymakers must look beyond the early firm stage, take a longer firm perspective, and apply a holistic approach. One problem is that high-growers perform using different methods, and it is also difficult to predict which firms will contribute to local, regional, and national development. Countries have endeavoured to strengthen high-growth firms or firms that want to scale up to address firm needs and also provide later-stage support for continued growth. However, many efforts are still focused on firms in the startup stage. Several studies have analysed the driving forces of high-growth firms and focused on a variety of critical factors, but the results are contradictory.

Some scientific papers are dedicated to high-growth firms, and several researchers have documented and analysed the spreading of efforts during this century (Shane, 2009; Brown and Mawson, 2013; Mason and Brown, 2013; Lundström *et al.*, 2014; Acs *et al.*, 2016; Brown and Mawson, 2016; Brown *et al.*, 2017; Goswami *et al.*, 2019; Audretsch *et al.*, 2020; Teruel *et al.*, 2022; Coad *et al.*, 2022). Owing to a smaller proportion of firms experiencing significant growth and generating numerous new jobs, these firms garner attention in policy contexts. In the short term, high-growth firms are indeed beneficial, especially for policymakers and venture capital investors; however, the possibilities of achieving more long-term growth are quite limited. Hence, a challenge is that only a few countries provide opportunities for firms to achieve sustained, long-term growth to become large in the long run. In

this context, Daunfeldt and Halvarsson (2015) conclude that industrial policy should consider focusing on creating growth for the majority of firms that are not high-growth firms, rather than supporting firms that have already demonstrated growth. It is also difficult to predict in advance potential high-growth firms, which means that policy measures should target growth-enabling conditions instead of concentrating efforts on all or only specific sectors.

The main part of previous studies has focused on startups or analysing high-growth firms, even if the high-growth literature is close to the scaleup question. Identification of *potential high-growth firms or firms that want to scale up* is not straightforward because the firms supported are high-risk and the milieu and environment for taking risks are not encouraging. Support must be identified, and policymakers and public administrators are often slow to react.

Sandberg and Alvesson (2011, p. 23) called the process of finding research gaps in the literature "gap-spotting." Given this gap, this study focus on surviving and stable technology-based firms that may want to scale up. The overall objective is therefore to study policies to facilitate the scaling up of technology-based firms. The literature provides relatively few examples of stable and slow-growing technology-based firms and how policies can be developed to assist these firms in scaling up. As a consequence of earlier research focusing on startups or high-growth firms, little attention has been paid *to surviving and stable firms that may want to scale up*. Some significant challenges remain in analysing this "scale-up gap," and explaining its relationship to policies. Policymakers have to adopt a long-term and comprehensive approach and look beyond the initial firm stage. Against the presented background, this study can formulate the research question as follows:

RQ: *How are policies designed to scale up technology-based firms?*

The objective of the present study is to examine policies aimed at addressing specific issues faced by growing firms and scaleups. The concept of growing firms, which guides this study, is complex, contentious, and ambiguous. This study also encompasses technology-based firms seeking to scale up the production and sale of an existing product or service. This focus leads us to certain limitations in terms of analyzed economic

policies, where the focus is not directed towards policies for a generally improved business climate, fostering more innovative startups, and for firms engaged in research and product development, seed funding, or initial R&D support for micro-firms. Regarding types of interventions, framework conditions are in focus; however, this study primarily targets technology-based firms wishing to scale up the production and sale of a product or service.

1.3 Approach and Contribution

This study is written as a foundational monograph that might be viewed as forming a starting point for future research regarding scaleups and policies promoting scaleups. The existing body of knowledge has, to some extent, overlooked the subject of scalability. However, it is worth noting that there is a substantial body of work dedicated to high-growth firms. Consequently, this study incorporates elements that delve into the domain of high-growth firms. The goal of the current study is to investigate policies aimed at addressing the specific challenges faced by stable firms that want to scale up.

The study develops a conceptual model for evaluating policies for scaling up technology-based firms. It is a detailed empirical analysis of technology-based firms and policies in several areas at the country level. The empirical part focuses on the design of financial support, framework conditions and innovation systems. Additionally, the study provides a tentative analysis of the differences in these three areas between the countries. The study develops a conceptual model for evaluating policies to encourage technology-based firms to scale up. This study consequently draws attention to the scaleup issue, which is crucial for numerous countries. This study includes seven countries outside the EU (the UK, the US, Brazil, India, China, South Korea, and Japan). Cases from South Korea, China, India, and Japan were selected because these countries are often considered as being among Europe's main competitors.

The remainder of this monograph is organised as follows: Section 2 presents the definitions of growing firms and product life cycles, Section 3 contains the theoretical framing, and Section 4 describes the method

and data. Section 5 and 6 present the findings, and Section 7 presents the analysis. Section 8 contains the conclusions.

Appendix

Table A.1: Public reports

(iii) Criscuolo, C, Gal, P. and Menon, C. (2014), "The Dynamics of Employment Growth: New Evidence from 17 Countries". OECD STI Policy Papers No. 14.

(ii) Duruflé, G., Hellmann, T. F., and Wilson, K. E. (2017), "From start-up to scale-up: Examining public policies for the financing of high-growth ventures". *Bruegel Working Paper, No. 2017/04*. Bruegel.

(iii) European Commission (2016), "Framework conditions for high-growth innovative enterprises (HGIE)". Final report. Costa, P., Ribeiro, A., van der Zee, F. and Deschryvere, M. http://publications.europa.eu/resource/cellar/e326b62f-24cd-11e7-b611-01aa75ed71a1.0001.01/DOC_1

(iii) European Commission (2021a), "Advanced Technologies for Industry – Policy brief. Scaling up technology startups". Roman, L., Romainen, J., Perez, M. and Izsak, K. European Innovation Council and SMEs Executive Agency. https://ati.ec.europa.eu/sites/default/files/2021-05/Scaling%20up%20technology%20startups.pdf

(iii) European Commission (2021b), "European scale-up gap: too few good companies or too few good investors?" Ambrosio, F., Brasili, A., Niakaros, K. Publications Office of the European Union, Directorate-General for Research and Innovation https://data.europa.eu/doi/10.2777/886042

(ii) EIB (2019), "EIB Investment Report 2019/2020: accelerating Europe's transformation". *European Investment Bank*. DOI: 10.2867/68943

(ii) Ferrando, A., Pal, R., and Durante, E. (2019), "Financing and obstacles for high growth enterprises: The European case". (no. 2019/03). *EIB Working Papers*.

(iii) Grover Goswami, A., Medvedev, D. and Olafsen, E. (2019), "High-Growth Firms. Facts, Fiction, and Policy Options for Emerging Economies". World Bank Group, Washington DC.

(i) Haltiwanger, J., Jarmin, R. S., Kulick, R. and Miranda, J. (2014), "High Growth Young Firms: Contribution to Job Growth, Revenue Growth and Productivity in Measuring Entrepreneruial Businesses: Current Knowledge and Challenges". National Bureau of Economic Research.

(iii) Kolar, J. (2014), "Policies to support High Growth Innovative Enterprises — Final report from the Session II of the 2014 ERAC Mutual Learning Seminar on Research and Innovation policies, European Commission, DG Research and Innovation". Brussels.

(iii) Lilischkis, S. (2011), "Policies in support of high-growth innovative SMEs - Part 2: Policy measures to improve the conditions for the growth of innovative enterprises". European Commission, DG Research and Innovation, Brussels.

(i) Nordic Innovation (2020), Scale-ups in the Nordics 2020. https://www.norden.org/en/publication/scale-ups-nordic-countries

(iii) OECD (2010), "High-Growth Enterprises: What Governments Can Do to Make a Difference". OECD Studies on SMEs and Entrepreneurship - OECD Publishing, available at: http://dx.doi.org/10.1787/9789264048782-en

(iii) OECD (2013), "An International Benchmarking Analysis of Public Programmes for High-Growth Firms". Prepared by the OECD Local Economic and Employment Development Programme in collaboration with the Danish Business Authority, OECD Publishing, Paris.

(ii) Pavlova, E. and Signore, S. (2019), "The European venture capital landscape: An EIF perspective. Volume V: The economic impact of VC investments supported by the EIF". *EIF working paper 2019/55*.

(ii) Reypens, C., Delanote, J. and Ruckert, D. (2020), "From starting to scaling: How to foster startup growth in Europe". *European Investment Bank*. https://doi.org/10.2867/42527

Table A.2: Background reports and authors

Country	Embassy, Background Report and Date	Authors
The UK	London, International outlook: Policy for knowledge-intensive companies that want to scale up. 2022-04-25	Marika Amartey and Emma Olsson
The US	OSI Washington, International outlook: United States policy for knowledge-intensive companies that want to scale up. 2022-04-28.	Maria Brogren, Jenny Majidyar, Cecilia Lif and Mikael Kihlberg
Brazil	OSI Brasilia, International outlook: Policy for knowledge-intensive companies that want to scale up – OSI Brasilia. 2022-04-29.	Jacob Silva Paulsen and Ana Carolina Bussacos
India	New Delhi, International outlook: Policy for knowledge-intensive companies that want to scale up – India. 22-04-26.	Per-Arne Wikström and Leena Kukreja
China	Beijing, International outlook on policies for knowledge-intensive companies that want to scale up – China. 2022-05-02.	Lena Bruce and Chen Yang
South Korea	Seoul, International outlook: Policy for knowledge-intensive companies that want to scale up. 2022-05-02.	Anders Hektor and Emma Bergqvist
Japan	Tokyo, Japan, Tokyo, International outlook on policies for knowledge-intensive companies that want to scale up: Japan. 2022-04-29.	Yumi Murakami, Michael Jacob and Shiori Schules

About the Author

Hans Löfsten, born in Gothenburg, Sweden, is a Swedish economist and professor, primarily active in the fields of innovation management and entrepreneurship. Löfsten obtained his PhD (Doctor of Economics) in 1992 at the School of Economics and Commercial Law, University of Gothenburg, Sweden. He became an Associate Professor in Technology Management at Chalmers University of Technology in 1999, a Professor in the same subject in 2005, and a Full Professor in Engineering Economic Analysis at Chalmers, Department of Technology Management and Economics, in 2007. Löfsten has also held positions at Gothenburg Research Institute (GRI) and Institute for Management of Innovation and Technology (IMIT). Previously, he has held positions at Chalmers as vice-dean, dean, and head of division during the 2000s. For many years, Löfsten has been involved in undergraduate and postgraduate education and has experience from many courses. Löfsten has also authored two textbooks in the field of industrial management and managerial economics.

Additionally, he has supervised, as a main or co-supervisor, ten doctoral candidates to their doctoral degrees, including within doctoral programs at other universities such as the University of Gothenburg and Linköping University. Hans Löfsten has authored a substantial number of international scientific articles spanning various areas. His research primarily focuses on an efficient resource allocation for technology-based

firms. The development of new technology-based firms and their innovations is crucial for new industrial structures and long-term economic development. Löfsten has published articles in journals such as Research Policy, Small Business Economics, R&D Management, Journal of Small Business Management, Technovation, Omega, The Journal of Technology Transfer, International Journal of Production Economics, and International Journal of Operations and Production Management. He is also well-known from several bibliometric studies where his articles on science parks, incubators, and new technology-based firms have been found to be prominent.

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