



Universidad Loyola Andalucía

Programa de Doctorado: Desarrollo Inclusivo y Sostenible

Tesis Doctoral

# **The Impact of Start-ups and Scale-ups in the Andalusian economy**

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*“Any author who uses mathematics should always express in ordinary language the meaning of the assumptions he admits, as well as the significance of the results obtained. The more abstract his theory, the more imperative this obligation.*

*In fact, mathematics are and can only be a tool to explore reality. In this exploration, mathematics do not constitute an end in itself, they are and can only be a means.”*

Maurice Allais (Nobel Prize in Economy, 1988)

*“Countries don’t create economies. Entrepreneurs and companies create and revitalize economies. The role of the governments should be to create a nourishing environment for entrepreneurs and companies to flourish, not to get in the way of economic development”*

John Naisbitt



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## **General abstract**

Although entrepreneurial spirit has traditionally been considered one of the main catalyst of the economy (Kirzner & Seldon, 1980) it has not been until a few years ago that public authorities have made a planned and organized effort to support entrepreneurial initiative (Peña, Guerrero, & González-Pernía, 2015). However, although many millions of euros are invested annually in this support, the effectiveness of this investment is rarely considered in relation with the impact of such entrepreneurial activity (start-up in English) on the economy (Lupiáñez, Priede, & López-Cózar, 2014).

On the other hand, in recent months, public authorities are increasingly focusing the on so-called scale-ups: start-ups that have experienced growth of over 20% for at least three consecutive years (OECD, 2007). The general belief is that these companies have a great impact on the economy, especially in terms of employment (Mind the Bridge, 2017), but there are still very few studies on this. Therefore, in an environment of scarce public resources, we must ask ourselves if we should continue dedicating public resources to the generation of new companies (start-ups), or these should be directed to the promotion of scale-ups.

In addition, in this type of companies there is an additional problem, and it is largely in the literature on this that it is practically impossible to identify in advance which companies will reach high levels of growth (Daunfeldt, Elert, & Johansson 2014)

The main objective of this thesis, therefore, has been to provide insight into the problem of devoting resources to continue supporting start-ups or dedicate them, totally or partially, to finance scale-ups. To do that, we have studied the economic impact of the entrepreneurial activity (start-ups) and of a particular type of high growth companies in which public authorities are currently focusing (scale-ups), comparing both impacts (start-ups and scale-ups) to draw conclusions. We have also focused on deepening the scale-ups phenomenon, analysing the factors that can predict their appearance. In order to do so, and to delimit the scope of our research, we have focused on a regional economy (the Andalusian).

This thesis contains six chapters:

Chapter 1 presents an overview of entrepreneurship and its contribution to regional development. In addition, the research questions and objectives of the thesis are presented.

Chapter 2 presents our research question and the objectives developed to respond to it. In addition, the methodology that has been used to reach our objectives and estimate the economic impact of start-ups and scale-ups is presented. Specifically, we present the main features of a SAM linear model. This methodology is based on the development of a traditional Input-Output table with a more disaggregated structure of expenditure and income, integrating the relationships between institutional sectors, estimated with information from national accounting systems. Finally, we describe the storyline followed in the three following chapters.

Chapter 3, 4 y 5 are dedicated to the practical application of the methodology. In particular, in Chapter 3 the impact of entrepreneurial activity in the Andalusian economy is estimated. In Chapter 4, venture growth is introduced, considering the importance it has for a regional economy and analysing the factors that differentiate Andalusian scale-ups from other companies. In Chapter 5, the economical impact of start-ups is compared with the potential economic impact of the high-growth firms considered scale-ups. These three chapters have provided the basis of three academic papers, which have been sent to different journals for publication. The first of them (corresponding to Chapter 3) has already been accepted by a high impact international journal indexed in Journal of Citation Reports. The other two are in the review process in high impact international journals indexed in Journal of Citation Reports or Scopus.

Chapter 6 provides conclusions, future research lines and practical implications to address the problem of designing public policies and allocating public funds to support entrepreneurship.

# **Chapter 1: Introduction: Contextualization of Research**



Entrepreneurship is becoming increasingly important to the global economy. Due to that reason, both academic literature and public authorities have devoted time and resources to studying the effect of entrepreneurship in regional development. This has been enhanced by the economic crisis, which has placed the focus on entrepreneurship and its role as an economic energizer. Moreover, both academia and policymakers agree in considering entrepreneurship as one of the main responses to the economic crisis (Iacobuta & Socoliuc, 2014). This is a consequence of the general opinion about the positive contribution of entrepreneurial activity to the economy in general, and the regional one in particular.

The concept of entrepreneurship, which is widely discussed in management studies, derives from the historical approach of Richard Cantillon in 1755, who introduced the term “entrepreneur” for the first time. Today, the concept of entrepreneurship has contributions from most areas of social sciences such as anthropology; economy; sociology; history; psychology; politics and other science fields (Lopes, Antunes, & Rodrigues, 2018). This interdisciplinary of the concept has meant that until now it has not been possible to reach a consensus regarding its meaning, so that each study carried out in relation to entrepreneurship must be interpreted in relation to the definition of the phenomenon that it uses.

Even so, Entrepreneurship is generally considered as one of the pillars for economic dynamism and one of the main drivers for economic growth of countries and regions (Acs, Desai, & Hessels, 2008). Furthermore, entrepreneurship appears as one of the main agents considered in regional development policies as it has been proved that is an important indicator of growth and performance differences between regions (Acs, Åstebro, Audretsch, & Robinson, 2016).

For this reason, the importance of the so-called entrepreneurial ecosystem (understood as the set of individual, social and institutional characteristics that, integrated in complex forms in the social, economic, political and cultural context of a country or region, favours or hinders the creation of new productive and sustainable initiatives in the market (Vera Ruiz et al., 2016) is growing. Moreover, the design of public policies for entrepreneurs is one of the key elements of this ecosystem. Not only this, but the degree of entrepreneurship in a particular country or region is related to the institutional background in which the entrepreneurial activity is performed, as this environment influences decisively the creation of new ventures (Fuentelsaz, Gonzalez, & Maicas, 2016).

Thereupon, on one hand, policymakers must design policies that encourage the entrepreneurial activity, and on the other, they must take into account that their decisions in other areas may have consequences in that entrepreneurial activity (Acs & Szerb, 2007)

However, 60% of new ventures fail and disappear in their first five years of life. Not only that but also, hardly ten percent of firms grow in this period and a very small percentage of them are able to create new jobs (Phillips & Kirchhoff, 1989). Hence, only entrepreneurs who are capable of growing and lasting over time significantly influence the economy of a country or region (Fuentelsaz & González, 2015). For example, in developing countries, a small number of high-growth companies can represent up to 50% of new jobs created in the country (Olafsen & Cook, 2016). This has opened a debate, especially in the European Union, on whether public resources dedicated to foster entrepreneurship should be oriented to promote high-growth companies (scale-ups). (European Commission, 2010). Therefore, the need to analyse in detail the phenomenon of the so-called scale-up companies and to compare them with new ventures (start-ups) has arisen.

Nevertheless, the large amount of existing literature on SMEs growth should not make us think that it is not space for further research into the subject, since there are still important gaps to cover in this field. This is due to the different theoretical frameworks, epistemological perspectives and interpretations as well as the inherent complexity and potential ramifications of the process itself (Davidsson, Achtenhagen, & Naldi, 2010). The little existence of studies on the growth factors for companies at a regional level is particularly noticeable, especially considering that at the macro level it has been shown that each region grows differently (Crespo Cuaresma, Doppelhofer, & Feldkircher, 2014; Porter, 2003; Tabellini, 2010 among others).

Another aspect that we would like to highlight is the liaison between entrepreneurship, v growth and inclusive and sustainable development (as this is the theme of the doctoral program completed, which culminates with this Thesis).

The most common definition of sustainable development is given by United Nations, that defines is as the "*ability to make development sustainable—to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs*" (Report of the World Commission on Environment and Development, 1987). But sustainable development have also has to be inclusive, i.e., development that allows people to participate in it and, in that way, benefit from economic growth (Lundstrom & Ianchovichina, 2009). In other words, this supposes that the rhythm of economic growth must be made compatible with the fact that it should involve

all social and economic sectors of the country or region. Otherwise, it could happen that growth happened from the economic point of view but at the expense of increasing the differences between different social sectors, and making this growth unsustainable in the long term. Therefore, this definition of development implies that macro growth policies must be linked to policies at a micro level. As we have seen, firm creation and growth is one of the issues related to economic growth, so we can affirm with undeniable reliability that entrepreneurial activity and business growth are factors to consider when designing policies that favour inclusive and sustainable development. Moreover, although it might seem an anecdotal topic, it is not the same to talk about sustainable and inclusive development that inclusive and sustainable development. It seems that the preferable order would be "inclusive and sustainable" and not the other way around. The reason for this is that it would not make sense to defend sustainability if it is not from inclusion; in other words, non-inclusive sustainability is not enough (Romero Rodríguez & Amador Hidalgo, 2016).

Fathoming the idea, nowadays sustainable and inclusive development is associated with the Sustainable Development Goals adopted by all United Nations Member States in 2015. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests. Of these 17 objectives, the eighth, called "Decent work and economic growth", promotes sustained, inclusive and sustainable economic growth, higher levels of productivity, technological innovation, full and productive employment and decent work for all people (United Nations, n.d.). This means that entrepreneurship should be encouraged since it is one of the ways to create jobs that in turn will contribute to the disappearance of forced labour, slavery and human trafficking.

Therefore, we can affirm that Entrepreneurship can be one of the engines for transforming our world and overcoming the diverse nature of these global challenges (Apostolopoulos, Al-Dajani, Holt, Jones, & Newbery, 2018). If we want economic growth, innovation and job creation, we need entrepreneurial activity.

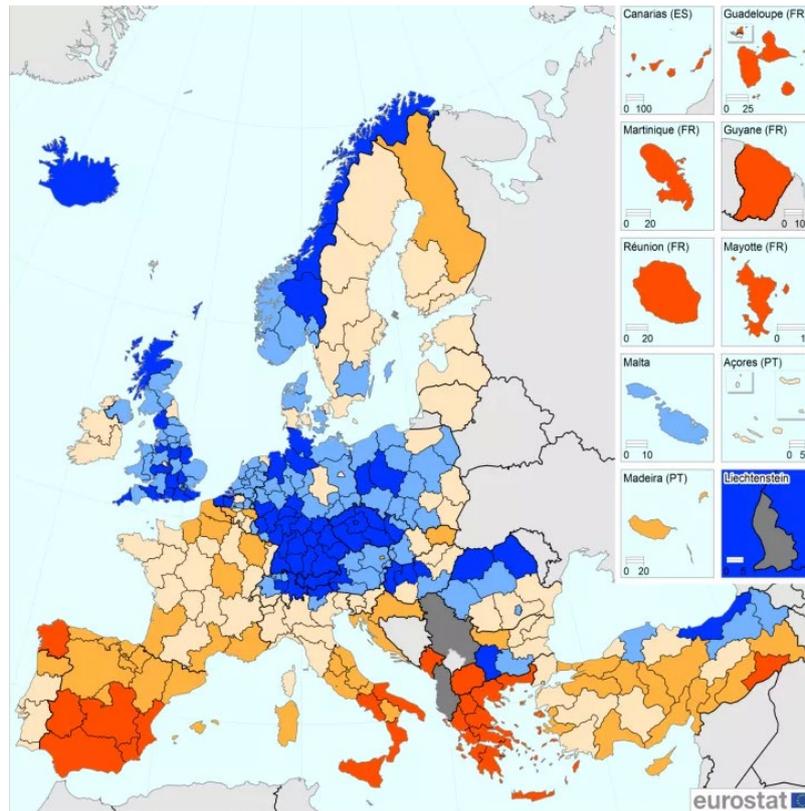
In addition, there are data and studies that support this assertion. For example, entrepreneurship positively explains the variations in the growth in African countries (Adusei, 2016) and have made significant contributions to the mini-dragon economies of Indonesia, Malaysia, Philippines, and

Thailand (Maritz et al., 2013). It has also been proved that entrepreneurship in Western Europe (with higher income per capita) is more settled and structured than in Latin America, although the Latin American population is more entrepreneurial than in Western Europe (Lopes, Antunes, & Rodriguez, 2018). Research has also evidenced that farmer entrepreneurship is an answer to alleviate rural poverty, so policymakers in developing countries should endow rural farmers with entrepreneurial skills (Naminse & Zhuang, 2018). We cannot gender perspective as well: in some developing countries, like Vietnam, women enterprises have contributed significantly to job creation and economic growth (Zhu, 2015).

In short, we can confirm that the creation and development of SMEs is one of the main ways for countries and regions with less economic development to escape from poverty.

Another element that contextualizes our research is its geographical scope: the region of Andalusia. Andalusia is the largest Spanish region by number of inhabitants with 8,379,248 (IECA, 2018) and an area of 87,268 square kilometres. However, it is behind the rest of the country and the European Union in terms of its economic development. Thus, according to the most recent Active Population Survey, corresponding to the third quarter of 2008, the unemployment rate is 22.9% (compared to 14.55% for Spain and 8.1% for the EU) (INE, 2018). This makes it the sixth European region with the highest levels of unemployment.

**Figure 1. Unemployment rates in the Europea Union regions in 2017**



Source: Eurostat

**Table 1. Regions with highest unemployment rates in Europe, 2017**

	<b>Region</b>	<b>Country</b>	<b>Unemployment Rate</b>
1.	Dytiki Makedonia	Greece	29.1%
2.	Ciudad Autónoma de Melilla	Spain	27.6%
3.	Dytiki Ellada	Greece	26.3%
	Extremadura	Spain	26.3%
5.	Mayotte	France	25.9%
6.	Andalucía	Spain	25.5%
7.	Ipeiros	Greece	24.8%
8.	Canarias	Spain	23.5%
9.	Kentriki Makedonia	Greece	22.9%
10.	La Réunion	France	22.8

Source: Eurostat

Andalusia is also the second Spanish region with more poor people. According to the Living Conditions Survey done by the National Institute of Statistics (INE), 31% of Andalusians live below the poverty line and 55% of households are at serious risk of poverty (INE, 2018).

On the other hand, according to the Regional Accounting, the GDP per capita of Andalusia in 2017 was 18,470€, the second lowest in Spain (INE, 2018).

This makes Andalusia a region where the implementation of sound economic development policies is a key issue. Considering the close relationship between entrepreneurship, business growth and inclusive and sustainable development, we understand that our research, which enhances the knowledge of entrepreneurial activity in the region, can be very useful not only to the scientific community but also to the political and to the business world.

Finally, a reflection on the method we are going to use to assess entrepreneurial activity and to compare it with scale-up companies must be done. One of the main tasks for public authorities is decision making on economic policies, which must take into account many and different issues. And given the clear connection between entrepreneurship and economic development, these economic policies must take into account the impact they have on entrepreneurial activity. However, most social sciences, including economy, faced the problem of obtaining quantitative information when it comes to analysing a specific situation. This is because it is hard to find acceptable measurements of the different processes involved in the economy. These complications come from the unfeasibility of conducting controlled experiments, as well as from the complexity of the processes to be analysed, submitted to a high level of subjectivism.

Except in exceptional cases, direct measurements will not be available and we must content with estimates or approximations, more or less complex, to the quantification of the process that we intend to analyse.

Considering all the limitations previously exposed, the tools available to economists to perform their measurements can be classified into four major categories:

- Records: these are measurements obtained by direct aggregation of records or annotations of certain economic transactions that agents are obliged to declare directly for non-statistical purposes. In general, a small number of public agencies and institutions maintains these types of records.
- Census: they consist, basically, in carrying out systematic counts of a certain economic process or situation, usually in physical units. Due to the cost associated with carrying out these censuses, they are usually carried out over long periods (e.g., the population census is carried out every 10 years).

- Surveys: this third group of measurements, which is possibly the most used in economics, is based on the estimation of the total volume of agents involved in a given process or situation; then a number of agents are selected (usually a reduced number compared to the total) and they are asked about their actions in the process or situation that is intended to analyse. Finally, the total value or volume is determined assuming that the total of the individuals follow a behaviour similar to that of the sample.
- Indirect estimation: The fourth basic procedure for obtaining economic measurements differs from previous ones in that it collects direct information from economic agents and is limited to obtaining information derived from the data obtained by any of the other procedures. This type of measurement obtained combines direct information with the existence of models or pre-established relationships between them, and requires the existence of an agency or institution directly interested in obtaining measurements (and, therefore, it will allocate economic and human resources to obtain them). An example of this type of measurement are National Accounts, which are based on a series of direct measurements of all kinds and accounting models are used to determine the values of the large macro magnitudes that define the economic activity of a country.

This need for economic science to have quantitative data as a starting point for its analysis is reinforced by an opinion trend in this field since the times of Leon Walras on the need to mathematically explain the economic processes and situations. Nowadays, any economic analysis that does not follow mathematical procedures, that does not use statistical analysis, or is not based on other types of empirical information collected, is considered as speculative (Ruggles, cited in Pulido San Roman, 2002).

Thus, in the field of economics, research carried out using mathematical techniques in the formulation and analysis of models has had the intellectual appreciation of the entire scientific community, although the dissemination and discussion of this knowledge has been limited by the mathematical complexities inherent to these developments. For this reason, it has been essential the development of data collection and analysis techniques, both in the field of general economy and business management (Pulido San Roman, 2002).

For this reason, our research has been mainly based on the use of a mathematical model that incorporates the fundamental relationships of the general equilibrium between the production structure, the income of several groups, and the patterns of demand, the so-called Computable

General Equilibrium Model (CGEM). We can define this model as a numerical representation of the conditions of simultaneous equilibrium in the markets of an economy, in which producers and consumers participate, being their behaviour a consequence from the maximization of profits, based on technology data, distribution of resources and preferences. The basic result is that under relatively acceptable conditions there is a set of prices that balance all markets at the same time. (Chisari, 2007). This model has the advantage that it tries to represent an economy realistically, becoming a powerful tool for ex-ante quantitative evaluation of the effects on it of certain policies (De Haan, 1994).

CGEM use the so-called Social Accounting Matrix (SAM) as a database. They are configured as multi-sector models, where the productive sectors vary depending on the interests of the application and the existing disaggregation in SAM. SAMs (which are included in the category of indirect estimation tools) try to amend and overcome some of the most obvious limitations of the conventional models of economic analysis: they allow incorporating all the economic transactions that take place among all the agents in a certain economy. More specifically, they show the mutual interrelation between the production structure, income distribution and consumption patterns, as well as to model the effect of a change in the exogenous variables on the structure of production and on the different economic institutions.

Currently, the development and application of CGEM has become a standard method for the analysis of economic policies in almost all areas of applied economics. For that reason, it has been applied in our research.

## **Chapter 2: Objectives and Research Design**



Based on the questions defined in the previous section, this research is underpinned by one central research objective: "To explore and examine if public authorities should shift public resources from supporting start-ups to fostering scale-ups, based on their impact on the economy".

This research objective will be achieved through a focus on four research questions:

- In relation to the entrepreneurial activity (start-ups):
  1. Define what can be considered as an entrepreneurial activity from the economic point of view.
  2. Analyse the effect of this activity on the Andalusian economy and its impact on it.
- In relation to high-growth companies (scale-ups):
  1. Compare the effect it would have if instead of creating new companies, existing ones were scaled.
  2. Establish what factors support that a start-up becoming a scale-up.

To answer our research question, we have established a series of hypotheses to contrast while developing it. These hypotheses are the following:

- Hypothesis 1: Entrepreneurship has a positive and multiplying effect on the economy of a region.
- Hypothesis 2: It is more desirable to focus efforts on promoting entrepreneurial initiatives than on encouraging start-ups to become scale-ups.
- Hypothesis 3: The effort that should be made so that the economic impact of scale-ups is comparable to that of start-ups is very high.
- Hypothesis 4: Start-ups have a greater impact on the regional economy than scale-ups.
- Hypothesis 5: Scale-ups have some features, beyond the pace of growth of their turnover, which differentiate them from other companies

To reach objectives 1, 2 and 3, the methodology followed is based on the development of a Linear Model of General Equilibrium (Pyatt & Round, 1977) for the Andalusian economy for the year 2014. This model will be based on the Social Accounting Matrix (SAM from now on) of Andalusia updated for the year 2014. A SAM, as it will be explained later, is a statistical-accounting instrument that collects all the information of an economic system and closes the circular flow of income,

estimating indirect and induced effects. This gives a general view of the implications of economic flows in the different sectors of activity and, at the same time, details and completes them (Fernández, Pilar, & Casimiro 2004). The SAM for Andalusia 2014 has a level of disaggregation of 35 economic activities (27 productive sectors plus 8 endogenous accounts that include items such as capital, consumption, labour, investment, taxes, public sector and foreign sector) (Cardenete, Delgado & Campoy, mimeo, 2016).

Likewise, impact vectors will be developed for entrepreneurial activity and the different hypotheses proposed for the scale-ups, for which it will be necessary to make estimations for each of the activity sectors, taking as a base the official statistical information available on the creation of companies in Andalusia. In addition, productivity indicators will be used for SMEs and newly created companies, to find out and estimate the magnitude of business start-up for each activity sector.

Following similar methodology as Cardenete, Fuentes & Vega (2017) and Cardenete & Lima (2007) we will obtain an accounting multiplier matrix, the components of which will reflect the impact generated by an exogenous income unit of endogenous account (Entrepreneurial activity per activity sector / Scale-ups per activity sector) on the income of endogenous account (Output / Employment per activity sector). Thus, the addition of the columns of the accounting multiplier matrix will reveal the total effect of an exogenous shock received by an endogenous account on the rest of the economic activity (backward linkage effect).

Therefore, the results will show the effects of the activity of start-ups and the scale-ups on the gross domestic product, productive output and employment creation, as well as their distribution by sectors of activity, in Andalusia.

Finally, in order to achieve the fourth objective of our research, we will conduct a review of the literature on business growth factors, to select these factors and, working on the available statistical sources, compare the presence of these in Andalusian companies in general and in scale-ups, and to be able to draw some conclusions about the differential features of this last group.

It is also important to point out that our research will be based on secondary sources, coming from official statistics (Eurostat, INE and IECA) and other institutions (CEA), so it has not been necessary to have the approval of our Research Plan by the University's Ethics Committee.

Regarding the expected impacts because of our research, we must point out that the emphasis on entrepreneurship as an agent for economic activity and as a source of job creation is already

recognized by the academic world as well as by the political and business world. However, there are hardly any definitions of the term Entrepreneur from an economic (and, accordingly, quantifiable) point of view. Thus, our research will provide a definition for this activity that it will be quantifiable and objective. That definition, on one hand will allow us to establish a model to measure the economic impact of the entrepreneurial activity, and on the other, it will also allow us to use it more effectively when defining economic policies by policymakers.

On the other hand, organizations that promote entrepreneurship have been debating for some time if it makes sense to devote part of the resources allocated to entrepreneurship to support scale-ups, given their supposed impact on economy and employment generation. This research aims to provide objective data that illuminate this debate.

Finally, and given that there is no unanimity on what should be considered a scale-up, our research aims to provide objective data on what characteristics distinguish these companies from the rest, so that public policies can be designed to support the development of these factors among companies, especially among start-ups.

The research developed has resulted in three papers that could be published by high impact international journals. The first one, named "Assessing the Economic Impact of Entrepreneurship on a Regional Economy using Social Accounting Matrices: the case of Andalusia" analyses the impact that entrepreneurial activity has, from the economic point of view, on a regional economy (Andalusia), based on the so-called Social Accounting Matrix, which allows estimating the interdependencies between the different productive sectors of an economy in a given moment. Moreover, as a starting point for this analysis, it is defined what can be considered an entrepreneurial initiative company from a quantitative point of view. The results obtained, in terms of Production, GDP and job creation, show how entrepreneurship, in the case of Andalusia, contributes to the sustainability of the economy, its growth and, above all, the reduction of unemployment in the short term.

The second paper, named "Predictive factors of the transformation of Andalusian companies into scale ups", begins analysing the importance of venture growth for the economy. It also presents the problem that high-growth companies are very difficult to pick out ahead of time (Shane, 2009). Several studies have been carried out to identify the factors that affect the likelihood that a company will enter on the path of rapid growth but these factors change from one region to another, because cross-country differences in economic performance affect them. Thus, the objective of our

research has been to identify these factors in the Andalusian companies, in order to predict in advance the chances of a company to transform into a scale-up.

Finally, the third one, named "Start-up or Scale-up? An approach through economic impact", starts off from the general belief that scale-up companies have a greater impact on the economy, especially in terms of job creation, and therefore, in a situation where public resources are scarce, it is necessary to ask whether these resources should continue to be devoted to generation of new companies, or these should be oriented to the promotion of scale-ups, and addresses the question. In order to do so, we have chosen a regional economy (Andalusia, in Spain) and have studied how this issue affects it. Our starting point has been the impact that entrepreneurial activity (start-ups) has on the regional economy of Andalusia in terms of GDP, productive output and employment, which we have compared with the effect it would have if instead of creating new ventures, only companies with the characteristics of a scale-up would be created. We also have compared the impact that it would have on the regional economy if a percentage of companies transform into scale-ups and compare it with the effect of star-ups. For that purpose, again, we have developed a multisector model, based on Social Accounting Matrices (SAM), to measure this impact, and we have applied it to Andalusia in 2014. The results obtained show how in absolute terms scale-ups have a greater impact on gross domestic product, productive output and job creation than traditional entrepreneurial activity. However, overall, star-up activity and scale-up activity, have similar impacts of the economy and, therefore, the allocation of funds to promote the creation of new ventures should be balanced with those oriented to the promotion of scale-ups.



## **Chapter 6: Conclusions**



In line with the main objective of our research, we have examined entrepreneurial and high growth firms activity in Andalusia in a given year (2014). For this purpose, we carried out three studies. By identifying the economic impact of entrepreneurial activity and scale-ups, as well as analysing the factors and characteristics that differentiate scale-ups from other companies a more comprehensive understanding of the process of scaling-up companies has been accomplished. The primary outcomes of this investigation are described below.

In relation to entrepreneurial activity, our objectives where, on one hand, to define what can be considered as an entrepreneurial activity from the economic point of view, and on the other to analyse the effect of this activity on the Andalusian economy and its impact on it. We have confirmed that entrepreneurial activity has a positive impact on the economic production of the region.

Therefore, we support the asseveration that states that regions with higher levels of entrepreneurial initiative have higher levels of production, compared to those where these levels are lower and, consequently, production and productivity are also lower than average. This reaffirms the need to consider entrepreneurs as one of the main assets of a regional economy and, consequently, public policies should be designed to support and encourage this activity as much as possible (Audretsch & Keilbach, 2004). This importance has increased in recent years because of the global economic crisis and the need to generate employment, as entrepreneurial activity fuels economic growth, because it creates new ventures and new ventures create new jobs, increase competition in the market, which in turn produces an increase in the efficiency of all companies as a whole and, consequently, productivity also rises.

However, many of the decisions that public authorities make in relation to entrepreneurship continue to be based on preconceived ideas and assumptions not based on empirical reality. The methodology proposed in this research has allowed us to quantify this assumption usually made by policymakers: the importance of entrepreneurship as a driving force for regional economic development has been proved and set in specific numbers, showing that, although most of the job creation and GDP still corresponds to large companies, public authorities must continue to foster entrepreneurship, not only for its contribution to the sustainability of the economy in the medium and long term, but also to reduce unemployment rates in the short term.

Given that the current economic models do not explicitly define and analyse entrepreneurs and entrepreneurial activity (Reynolds et al. 2005) and that the evidence of the effect of

entrepreneurship on economic growth is far from being clear (Stel et al. 2005), our research implies an advance in the measurement of this effect, while providing a useful method for policymakers when designing policies to foster entrepreneurship.

Another contribution from our research, derived from the previous one is that, although Entrepreneurship is a widely used term, which has been studied by scholars from different academic backgrounds, there is currently no commonly accepted definition of entrepreneurship on a global scale, which has led to an open debate about the meaning of the term, as the question remains unanswered (Obino Mokaya et al., 2012).

Our research proposes a definition of entrepreneurial activity bounded in economic terms, which allows the measurement of it in an objective manner. This definition, moreover, is based on the TEA rate defined in the Global Entrepreneurship Monitor (GEM), which is the study on entrepreneurship most cited by the academic literature at a global level (Wong, Ho, & Autio, 2005; Valliere & Peterson, 2009; Álvarez, Urbano & Amorós, 2014, among others).

Regarding our third and fourth objectives, related to high-growth companies (scale-ups), which where to compare the effect it would have if instead of creating new companies, existing ones were scaled and establish what factors support that a start-up becoming a scale-up, we have reviewed the potential need for policymakers to rethink public policies to favour scale-ups rather than start-ups, and we have tried to prove that scale-ups, growing quickly with the right help and ambition, would be more beneficial to economies than start-ups.

To do so, we have compared the economic impact of start-ups with the potential impact of scale-ups, and found out that, although scale-ups have proportionally greater economic impact, the risk of ceasing support to start-up companies to focus on scale-ups is high, since it is foreseeable that these will not have, as a whole, the economic impact needed to replace the economic effect produced by these new companies. Nevertheless, the result of our research also shows that the current trend from policymakers to stimulate scale ups to the same extent that entrepreneurship is convenient, and resources allocation should be balanced, as some experts like Daniel Isenberg, state that policies to create environments that stimulate entrepreneurs have tilted "90/10" in favour of start-ups versus scale-ups (Isenberg, 2012)

It is also important to take into consideration that remaining a scale-up is an enormous challenge for companies. The difficulties can be easily explained by comparing percentage growth criteria, as high growth is defined in comparison with the firm's previous period turnover. In this sense, it is

much easier for a company to become a scale-up in its early days than it is to remain a scale-up throughout its existence (Isenberg & Onyemah, 2016).

This has led us to explore the factors that are present in Andalusian scale-ups (and are not in the rest of companies), to try, on one hand to predict which companies will have greater possibilities to move on to the scaling phase, and, on the other serve as an orientation to the public authorities when choosing which scalable companies to favour, in the environment of scarce public resources previously commented. We believe this is an important and relevant contribution of our research, as there still are a limited number of studies that focus on the factors that distinguish a scale-ups company beyond its elemental characteristic (turnover increase), specially at the regional level. And, as it also has been proved that there are cross-country differences that imply differences in economic performance between companies, is important to have focused the research in a specific region (and with a great need to develop and grow) as Andalusia (Cardoso, 2018) .

We have found out that, in Andalusia, the main differences between scale-ups and other companies are related to some firm characteristics, like firm age and activity sector, and to strategic factors, being the difference higher with scale-ups with more than 10 employees (as the OECD considers these companies should have).

Being very interesting and significant the results obtained, we cannot fail to point out some of the restrictions that we have found when doing our research. These have been:

- There is currently no commonly accepted definition of entrepreneurship on a global scale, which has led to an open debate about the meaning of the term. For this reason, and for the purpose of the research carried out in this paper, the term entrepreneurship has been associated with new business generation. However, we have to take into consideration that the concept of entrepreneurs associated with venture creation could not be used in developing countries, due to the prevalence of informal entrepreneurship in those regions (Williams et al., 2017). This is due to the fact that in these countries many companies do not register at the moment of their creation and / or do not declare to the authorities what their turnovers are, which makes it extremely difficult to obtain real data on the entrepreneurial activity.
- There is no empirical evidence on the productivity of newly created companies, compared with the one for established business. Consequently, it has been necessary to estimate the productivity of newly created companies in Andalusia, assuming that is the same than that of existing small businesses.

- Our research does not take into account the firm size, in terms of turnover, prior to its growth, although different researches about this issue have shown, in a recurrent manner, that age and size of the company are related to its growth pace (Choi et al., 2017).
- The research on scale-ups characteristics has been done based on a sample. Because of the online format; we have been unable to randomize the sample population, which may have resulted in reduced variation in data, although the confidence interval and the sample error are within the limits commonly accepted for market research.
- Another limitation is related to factor that cannot be easily analysed. As it was stated in our literature review, there are subjective factors (such as the capacity and motivations of the entrepreneur) that are of great importance to explain the growth of a company. But, precisely because of this subjective nature, we have expressly excluded them from our research, focusing it on those factors that can be explained and measured objectively. In addition, some strategic issues related to growth, such as the scalability of the business model or the characteristics of products are difficult to define and quantify, and therefore have been excluded from our research.
- Lastly, we have to take into consideration that rapid growth in a given period of time (in this case, three consecutive years) does not necessarily suggest that the company will keep on growing in the following years (Coad et al., 2017), so this research should be updated from time to time, to ensure that the results do not oscillate from one year to the other.

Taking together the previous literature and the results from this thesis, suggestions for some future research are identified:

- First, we believe it would be of enormous interest to have reliable and verified data related to the productivity of newly created companies.
- Another line of investigation could be developed related to matching the impact of entrepreneurial activity (and especially its impact on job creation) with Entrepreneurship Promotion Public policies developed by Policy Makers.
- It also would be interesting to extend investigation to find out the real importance of scale-ups in a regional economy as a whole, since there are hardly any statistics that reflect which percentage of companies existing in a country or region can be considered as scale-ups (among other reasons, because there is still no consensus regarding its definition)

- Furthermore, there is a need to study in depth if personal characteristics really are a factor to be considered in scaling-up companies, especially when we have found out that most of these companies are first-generation companies. Thus, studies that deepen in what kind of people have the right characteristics to start a business that becomes a high growth company are needed.
- Finally, we believe that this research could serve as a departure point for studies involving scale-ups from different countries, drawing comparisons of the phenomenon in different socio-cultural environments. In addition, we believe that it is still possible to deepen in the subject and seek new theoretical and methodological approaches capable of contributing to the understanding of the scale-up phenomenon, through exploratory and confirmatory studies.

To conclude, our research has provided objective data to the open debate about supporting start-ups or scale-ups. It has also provided an economic model to measure both phenomena and have objective information when it comes to decision making by policymakers.

We have also provided evidence on what characteristics distinguish scale-ups from other companies, so that public policies can be designed to support the development of these factors among companies.

The debate on business support and scale-ups is open and it will be for a long time. Nevertheless, with a greater understanding of the process, the impact of providing support to firms displaying high growth characteristics should become easier to measure and public authorities interventions will become more tailored to circumstances.



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