Journal of Management for Global Sustainability Volume 8, Issue 1 (2020): 155–196

DOI: 10.13185/JM2020.08109

START-UP OR SCALE-UP?
An Approach through Economic Impact

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ABSTRACT

Entrepreneurship is considered to be one of the engines for transforming our world and overcoming the diverse nature of global challenges as it promotes sustained, inclusive, and sustainable economic growth, higher levels of productivity, technological innovation, full and productive employment, and decent work for all peoples (United Nations, n.d.). Over the last decade, however, this belief has been shown to be flawed given that the typical start-up is not innovative, creates only a few jobs, and generates little wealth. Policy makers are increasingly focusing as such on the so-called scale-ups, or start-ups that have experienced growth of more than 20% over the last three consecutive years. The general belief is that these companies have a big impact on the economy, especially in terms of job creation. The purpose of this paper, then, is to test whether public resources should continue to be devoted to the generation of new companies or if these should be oriented toward the promotion of high growth companies that are defined as scale-ups. To accomplish this task, we developed a multisector model based on Social Accounting Matrices (SAM) to measure this impact of start-ups and scale-ups and applied it to a regional economy (Andalusia). The results obtained suggest that while scale-ups have a greater impact on gross domestic product, productive output, and job creation compared to traditional entrepreneurial activity, this is not large enough to replace the latter.

KEYWORDS

Social Accounting Matrices; entrepreneurship; start-ups; scale-ups

Submitted 1/14/20 | Accepted 3/11/20 | Published 6/30/20

INTRODUCTION AND OBJECTIVES

Entrepreneurship can be one of the engines for transforming our world and overcoming the diverse nature of challenges on a global scale (Apostolopoulos, Al-Dajani, Holt, Jones, & Newbery, 2018). This idea—that we need entrepreneurial activity if we want economic growth, innovation, and job creation—is reinforced by the 17 Sustainable Development Goals (SDGs) that were adopted by all United Nations member states in 2015, goals that form an urgent call to action by all countries—both developed and developing—in a global partnership. They recognize that ending poverty and other forms of deprivation 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. Thus, the eighth of these 17 objectives, "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 peoples (United Nations, n.d.). Entrepreneurship should be encouraged, therefore, since it is one of the ways to create jobs which contribute in turn to the suppression of forced labour, slavery, and human trafficking.

There are data and studies that support this assertion. Entrepreneurship, for example, serves as a positive explanation for variations in growth among African countries (Adusei, 2016) and has made significant contributions to the "mini-dragon" economies of Indonesia, Malaysia, the Philippines, and Thailand (Maritz, Le, Masli, de Waal, Verhoeven, & Shieh, 2013). It has also been proven that the Latin American population is more entrepreneurial than that of Western Europe even though entrepreneurship is more settled and structured in Western Europe (with higher income per capita) than in Latin America (Lopes, Antunes, & Rodrigues, 2018). Research has produced evidence, moreover, that shows farmer entrepreneurship to be a solution for alleviating rural poverty, thereby suggesting that policymakers in developing countries should endow rural farmers with entrepreneurial skills (Naminse & Zhuang, 2018). We can confirm, therefore, that the creation and development of SMEs is one of the main ways for countries and regions with less economic development to escape poverty (Cardona, Rada, & Palma, 2017; Lederman, Messina, Pienknagura, & Rigolini, 2014; Silva, 1982; Zhu, Kara, Chu, & Chu, 2015).

On the other hand, it is generally accepted that a small percentage of companies can generate large benefits for society. A small group of fast-growing firms, for

instance, can generate a significant proportion of employment (Henrekson & Johansson, 2010). For this reason, the so-called high-growth companies are, as engines of economic growth and employment, increasingly attracting the attention of researchers and policymakers alike.

The European Commission, for example, specifically mentions in its strategy *Europe 2020* that one of its objectives is "to create the conditions for high growth SMEs to lead emerging markets and to stimulate ICT innovation across all business sectors" (European Commission, 2010). Understanding the impact of scale-ups on the economy, however, is a recent construct, although there are published studies that have described some of its effects, such as how a small percentage of high-growth firms is responsible for the net creation of many jobs (Hagen & Zucchella, 2014).

Nevertheless, it is important to note that it is practically impossible to identify in advance which companies will reach high levels of growth (Daunfeldt, Elert, & Johansson, 2014). There is also evidence, moreover, that both start-ups and established businesses have rapid growth potential (Wright, Roper, Hart, & Carter, 2015). For this reason, most efforts in designing public policies have been oriented toward facilitating conditions that are generally favorable for both the creation of new businesses and the early stages of business growth.

Policies designed to stimulate business growth, however, are different from those needed to stimulate the creation of new ventures, even though framework conditions are theoretically the same for both newly-created and high-growth firms (Gibb, 1993; Huggins, Morgan, & Williams, 2015). A recent report supported by Tata Consultancy Services, for example, gathered the opinions of European entrepreneurs who mentioned that while start-ups had access to business support as well as capital through many regional funds, support for the scaling up stage was harder to find (ThinkYoung, 2018). Indeed, one important issue to be considered is that the amount of financing necessary for a company to grow rapidly is much greater than that necessary to start it up. High-growth firms in the United States, for instance, require at least three times more funding compared to what was needed at the start-up stage (Duruflé, Hellmann, & Wilson, 2017). The problems of start-ups as such differ from those of scale-ups; as a consequence, the needs of each are different from the other. They are vulnerable in diverse ways and need special assistance and programs to support them.

All this, nevertheless, has led the public sector especially in Europe to take a special interest in the promotion of so-called scale-ups. The European Commission, for example, launched the initiative Start-up Europe Partnership, which is aimed at transforming European start-ups into high-growth companies (Onetti, 2014).

Our research, therefore, aims to address the question regarding which kind of ventures policymakers should predominantly support—either newly-created ventures (start-ups) or high-growth firms, specifically scale-ups. It focuses on Andalusia, Spain's largest region by number of inhabitants—8,379,248 (IECA, 2018)—and with an area of 87,268 square kilometers. It lags behind the rest of the country and the European Union, however, in terms of its economic development. The unemployment rate, for instance, based on the most recent Active Population Survey, which corresponds to the third quarter of 2008, was 22.9% (compared to 14.55% for Spain and 8.1% for the EU) (INE, 2018). This makes it the region with the sixth highest level of unemployment in Europe.

RANK	REGION	COUNTRY	UNEMPLOYMENT RATE
1	Dytiki Makedonia	Greece	29.1%
2	Ciudad Autónoma de Melilla	Spain	27.6%
3	Dytiki Ellada	Greece	26.3%
4	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 Réunio	France	22.8%

Table 1: Regions with the Highest Unemployment Rates in Europe (Eurostat, 2017)

Andalusia is also the Spanish region with the second highest number of individuals living below the poverty line. According to the *Living Conditions Survey* of the National Institute of Statistics (Instituto Nacional de Estadística [INE]), 31% of Andalusians live as such while 55% of households are at serious risk of poverty (INE, 2018). Based on regional accounting, moreover, the GDP per capita of Andalusia in 2017 was €18,470, which is the second lowest in Spain (INE, 2018). This makes

Andalusia a region where implementing sound economic development policies is a key issue.

Bearing in mind the close relationship between entrepreneurship, business growth, and inclusive and sustainable development, we therefore understand that our research, which enhances the knowledge of entrepreneurial activity in the region, can be useful not only for the scientific community but also for the political and business worlds as well. The study focuses on comparing the economic impact of new ventures (start-ups) in Andalusia with the potential economic impact of high-growth companies (scale-ups) in the same region. We aim to prove that there is greater wealth and job creation in these latter companies and that it is necessary, therefore, to promote specific economic policies for this kind of venture.

This paper is organized into six sections. In what follows, Section 2, we review the concepts of start-up and scale-up to delimit the differences between both, and so that we can have a definition that allows for the measurement of their economic effects. In Section 3, we present the Social Accounting Matrix methodology that will allow us to measure these effects. We then develop the model and the scale-up's economic impact vector for Andalusia in Section 4, and present the main results from these estimations in Section 5. Lastly, we discuss our findings and draw some conclusions in Section 6.

START-UPS VS SCALE-UPS: CONCEPTUALIZATION AND DELIMITATION

Entrepreneurship is one of the driving forces of economic progress (Kirzner, Hannah, & Seldon, 1980). No society is capable of progressing in its parameters of well-being if it does not become sufficiently competitive. It needs to become innovative as a whole to do this, however, and so needs entrepreneurs to accomplish such. This fact is confirmed by many examples in different countries such as New Zealand, Finland, South Africa, Israel, India, and Japan, to name just a few. The issue of entrepreneurship and the support for small and medium sized enterprises (SMEs) have therefore been an important part of the economic strategy of national governments, especially in developed countries (Čadil, Mirošník, & Rehák, 2017). It has also become a concern in recent years in the field of regional science, particularly since many of the formulas that have been proposed as solutions to the economic

crisis have been based on the promotion of entrepreneurship (Doran, McCarthy, & O'Connor, 2016; Gittell, Sohl, & Tebaldi, 2014), especially given the long-term relationship between new-firm start-ups and the unemployment rate (Aubry, Bonnet, & Renou-Maissant, 2015). The evidence firmly suggests, moreover, that policymakers should launch policies that promote entrepreneurship as a means of boosting economic activity at the regional level (Hafer, 2013).

Entrepreneurship is also associated with positive values (Lupiáñez, Priede, & López-Cózar, 2014) since it usually refers to people with courage and enthusiasm who embark on the adventure of starting a business and who overcome the problems that may be encountered along the way (Toril & Valenciano, 2011).

Despite its widespread use, however, the truth is that there is currently no official or globally accepted definition for the term "entrepreneur." The debate on this concept has long been open ever since (Mokaya, Namusonge, & Sikalieh, 2012), with no definitive understanding having been reached as of now. Thus, to measure entrepreneurship at the regional or industrial level, much of the industrial organization literature refers to the foundation and emergence of new enterprises (Acs, Desai, & Hessels, 2008; Audretsch, Kuratko, & Link, 2015; Tran & Santarelli, 2017).

To this end, the Global Entrepreneurship Monitor (GEM)[1] understands entrepreneurship to be any attempt at new business or new venture creation that is carried out by an individual, team of individuals, or established business, such as self-employment, starting a new business organization, or expanding an existing business after it has survived for more than three and a half years (Wong, Ho, & Autio, 2005). This same report also focuses on the phase that combines the stage before the start of a new venture (nascent entrepreneurship) and the stage directly after the firm opens (owning-managing a new firm). Taken together, this phase is defined as "Total Early-Stage Entrepreneurial Activity" (TEA). While some authors have criticized this name, especially given that business creation statistics could also be driven by other factors such as changes in legal or tax regulations (Hafer, 2013), and since

[1]The GEM Project, which is the main global study on entrepreneurship, was born in 1999 and is led by researchers from London Business School (U.K.) and Babson College (U.S.A.). Its objective is to assess the level of entrepreneurial activity in different countries, understand how it evolves over time, and make comparisons between different nations, all based on empirical data (Álvarez, Urbano, & Amorós, 2014).

current economic models do not explicitly define and analyze entrepreneurs and entrepreneurial activity (Reynolds et al., 2005), this scope of the concept is what will be considered for this study since it allows us to limit entrepreneurial activity to a specific and measurable number of companies. It is also significant from the legal point of view, and hence acceptable when defining economic policy instruments oriented toward this activity.

The evidence of entrepreneurship's effect on economic growth is far from clear, however (van Stel, Carree, & Thurik, 2005). The belief in the kindness of this effect has been flawed as well, particularly given that typical start-ups are actually not innovative, create few jobs, and generate little wealth (Shane, 2009). There are also studies noting that the return on investment for start-ups encouragement is poor (Isenberg & Onyemah, 2016). This has led some authors to assert that focusing entrepreneurship policy almost exclusively on start-ups favors the quantity of start-ups at the expense of the quality of scale-ups (Isenberg, 2012).

Public authorities have thus dedicated part of the funds previously allocated for entrepreneurship toward stimulating "gazelles" or high performance companies (Stam, Suddle, Hessels, & van Stel, 2006). This high growth ability means that these firms will probably have a greater impact on both the economy and the generation of employment, thus posing a challenge to public authorities who inquire about whether to continue contributing resources to the generation of new ventures (with the risk that many of them will not survive after 42 months) or focus on encouraging scale-ups and thereby allow for faster and more sustainable growth over the medium term (Rodríguez & Macías, 2016).

To address this question, policymakers need to nail down the meaning of the term "high-growth firm" since public policies need to be oriented toward solving bounded situations that require definitions to be as objective and concrete as possible (Cejudo & Michel, 2016). For this reason, therefore, the European Union has designated the term "scale-up" to refer to the kind of firm that it is interested in supporting. These companies are conceived of as a type of high-growth firm but with particular characteristics (da Rosa, de Mello, & Ferreira, 2018).

It is necessary, therefore, that we focus on the meaning of the term "scale-up." Unlike with the term "entrepreneur," there is not much literature about it, due, among other things, to the relative newness of the concept and its being used mainly

by European policymakers. The literature as such still refers to these companies as HGFs (high-growth firms) (Mason, Brown, Hart, & Anyadike-Danes, 2015; Krasniqi & Desai, 2016; Demir, Wennberg, & McKelvie, 2017, among others).

The usual starting point in defining the term "scale-up" is to identify this kind of company with those that grow consistently and significantly (Isenberg & Onyemah, 2016). Such growth is quantified by European public authorities who state that any venture that experiences an average annual growth in employment and turnover of more than 20% over a period of three consecutive years should be considered a scale-up (Eurostat, 2017). Different qualifications are then introduced from this point on—for instance, that a scale-up must have at least ten employees (OECD, 2007) or a turnover of more than five million euros (Jensen, 2017) at the beginning of the three-year period, or raised funding exceeding one million euros (Mind the Bridge, 2017). There has been some criticism of these definition restrictions, though, particularly given that cross-country comparisons might become problematic since the proportion of small firms and their growth patterns may differ (Daunfeldt, Johansson, & Halvarsson, 2015) and not all high-growth firms expand in the same way (Delmar, Davidsson, & Gartner, 2003).

The definition of a scale-up, therefore, focuses on companies that have experienced significant growth in their size, which is the most reliable and objective measure of their value and a good approximation, at least indirectly, of how innovative they are. It is also independent of the company's activity sector as scale-ups can occur in any industry (Duruflé et al., 2017).

For the European Commission, the characteristics of scale-ups are as follows (Mind the Bridge, 2017): they are SMEs

1. usually with less than five years of operating experience;
2. with a verified, operational, and effective business plan, a stable team, a consolidated cash flow, and a relevant position in the market of origin;
3. with high but at the same time realistic ambitions, exhibiting potential for expansion in markets driven by innovation in a broad sense (with technological, knowledge-based, innovative business models, etc.);

4. that want to develop the European Single Market, marketing new products or services, or innovating on existing ones, to expand their business beyond national borders and therefore create growth opportunities; and
5. willing to receive and properly manage the financial support that is necessary for their expansion (e.g., loans, guarantees, venture capital, or any other relevant source of financing).

Scale-ups, in addition, are financed differently from start-ups since their capital needs are much greater. Such financing usually requires large venture equity rounds (Duruflé et al., 2017) and, as a consequence, the availability of large funds. This is a challenge for those who need to review and redesign the entire entrepreneurial ecosystem (Mayer, Micossi, Onado, Pagano, & Polo, 2017), particularly given that different types of expertise are needed at the scale-up stage. For this reason, then, policymakers in many countries provide significant capital for the start-up stage while only a few have ventured into financially supporting scale-ups. This is particularly relevant in Europe, where funding available for venture capital investment is five times less than in the United States (€5 billion vs. €26 billion) (European Commission, 2016), affirming the fact that access to finance is one of the biggest barriers to scaling up.

It should be noted, however, that the term "scale-up" is associated in some cases with a specific phase of the development process of a company and/or with a specific type of firm. A high-tech company, for instance, that is in a stage of development in which it seeks to grow in terms of market access, income, and number of employees, and which relies on collaboration with already established companies in doing so, would therefore be a scale-up in this regard (Onetti, 2014). Companies that have overcome the launching phase and are in full execution of a previously defined business model would also be considered accordingly as scale-ups. The term is thus used to refer to entrepreneurial ventures that are past their initial exploratory phase, have found their initial product/service offering and market segment, and are entering a growth phase where they are seeking significant market penetration (Duruflé et al., 2017).

METHODOLOGY: INPUT-OUTPUT MODELS AND SOCIAL ACCOUNTING MATRICES

The relationship between new businesses and economic development is quite complex. While most studies focus on its effect on employment (Arauzo-Carod, Solís, & Bofarull, 2008; Doran et al., 2016; Gittell et al., 2014), new firm creation can have two types of effects on economic development: direct and indirect (Fritsch & Mueller, 2004). Indicators for regional performance other than simply employment change should therefore be utilized.

The main problem that arises when assessing the economic impact of entrepreneurship is that the data used come from a variety of sources (see, for instance, Cumming, Johan, & Zhang, 2014). Some of the data collection periods, assumptions, and definitions, therefore, may not align perfectly (Summers, 2015). Survey research designs, moreover, continue to be the dominant data collection mode in entrepreneurship research; as such, the need to broaden the variety of data collection techniques is pointed out in the literature (Martinez, Yang, & Aldrich, 2011; Rogoff, 2012).

The methodology we will use to analyze the economic impact of start-ups in comparison with that of scale-ups is based on the concept of the Social Accounting Matrix (SAM). SAMs are matrix presentations of the whole set of economic flows among agents in a given time period, typically one year, and involve the integration of social statistics in the system of economic accounts, i.e., the integration of information provided by Input-Output Tables (IOTs) that show the intersectoral relationships in economic systems and the relationship among productive structures and transactions of distribution, accumulation, and use of income by different institutions (Fernández-Macho & Gonzalez, 2004). These models have allowed for a significant advance in data analysis and modelling, especially with regard to the analysis of socioeconomic impacts.

The origin of the Social Accounting Matrices is in the attempt to integrate social statistics with the Input-Output Model of the interdependence of productive sectors, thereby representing an extension of these models in matrix form (Stone, 1962). However, given their usefulness for understanding the intersectoral relations of the economy and the distribution of income, the first SAMs were designed with the aim of implementing programs that would lead to poverty reduction in developing

countries. The SAM of Sri Lanka, among others, should be noted for the impetus given in this field and for its applications, with special reference to the analysis of multipliers (Pyatt & Round, 1977).

The Input-Output Tables thus show the interdependence of productive sectors and their relation to final demand. SAMs also incorporate all transactions between productive factors and final demand components, thereby expanding the information provided by the input-output tables and completing the circular flow of rent in a square matrix. The utility of Social Accounting Matrices, as we have already pointed out, is twofold: they reflect, on the one hand, the situation of an economy at a moment of time because they describe an economic reality and yet are very useful, on the other hand, as a database for constructing models (Linear SAM Models and General Equilibrium Models) that value the socio-economic impact of different economic policies and demand shocks. This is why a SAM provides an appropriate framework for analyzing primary socioeconomic matters such as employment, poverty, growth, income distribution, etc. (Fuentes-Saguar, Vega-Cervera, & Cardenete, 2017).

Each account in a SAM is represented in a row and in a column. By convention, the rows show the source of income of the different accounts while the columns indicate where those revenues are spent in the form of expenses. The values that appear in the cells are monetary; each non-zero value in a cell reflects a transaction or monetary flow between two accounts posted in a single record, meaning an expense for the column and an income for the row.

The structure of SAMs is flexible and can take on different forms depending on its motivation. If the objective is to analyze a specific sector, for instance, accounts corresponding to the sectors can be more or less disaggregated. Types of consumers or taxes can be disaggregated if social or fiscal policies are to be assessed, and the account of the external sector can be separated into different areas, and even at the regional level to assess interregional relations. The number of accounts of the intermediate consumption matrix can also be doubled, thereby distinguishing between activities and products, and using, in this case, the Tables of Origin and Destination of the Input-Output Model and thus allowing for secondary productions (Cardenete & Sancho, 2003). Indeed, there are also matrices in which the order of the accounts is determined by that part of the system that the user wishes to highlight.

The level of disaggregation and the order of the different accounts should be designed according to the model to be built with the SAM and its application, placing greater emphasis on accounts that will be the objects of analysis or based on their motivations, e.g., for regional, sectoral, or fiscal analysis, etc. While these are very flexible models, as has already been mentioned, there is a basic structure that can be considered to be the standard, although certain rules must be fulfilled so that SAMs have meaning by themselves and utility as databases. Figure 1 briefly shows this structure, indicating in shading the part that corresponds to an Input-Output table.

	PRODUCTION	PRODUCTION FACTORS	INSTITUTIONAL SECTORS	INVESTMENT	FOREIGN SECTOR
PRODUCTION	Intermediate Consumption		Consumption of the Public Sector and Households	Gross Capital Formation	Exports
PRODUCTION FACTORS	Added Value Payments to Factors				
INSTITUTIONAL SECTORS	Taxes on Activities and Goods and Services	Allocation of Factor Income to Institutional Sectors Current	Transfers between Institutional Sectors	Taxes on Capital Goods	Transfers from the Rest of the World
INVESTMENT		Fixed Capital Consumption	Savings of Institutional Sectors		External Savings
FOREIGN SECTOR	Imports		Transfers to the Rest of the World		

Figure 1: Abbreviated Structure of a Social Accounting Matrix (authors' elaboration)

When building a SAM, we must keep in mind that it must be consistent with national accounts and that it must meet certain identities, particularly given that the total sum of each row (jobs) must coincide with the total sum of each column (resources) since the expenses of an account (column) must be covered by its income (row). The disaggregation of the accounts, moreover, must be made in such a way that they are homogeneous and clearly distinguishable from each other.

According to their basic structure, SAMs are interpreted as follows: the productive system generates incomes that come from the sale of its products (both to the productive system itself in the form of intermediate consumptions and to final demand) which is remunerated to the productive factors. These incomes form added value and represent the income of the institutional sectors, which in turn spend their incomes on the productive sectors and for payment to the institutional

sectors themselves, generating income for both. The increase in these incomes thus comes with the increase in production needs, starting the cycle anew. These interrelationships are shown graphically in Figure 2.

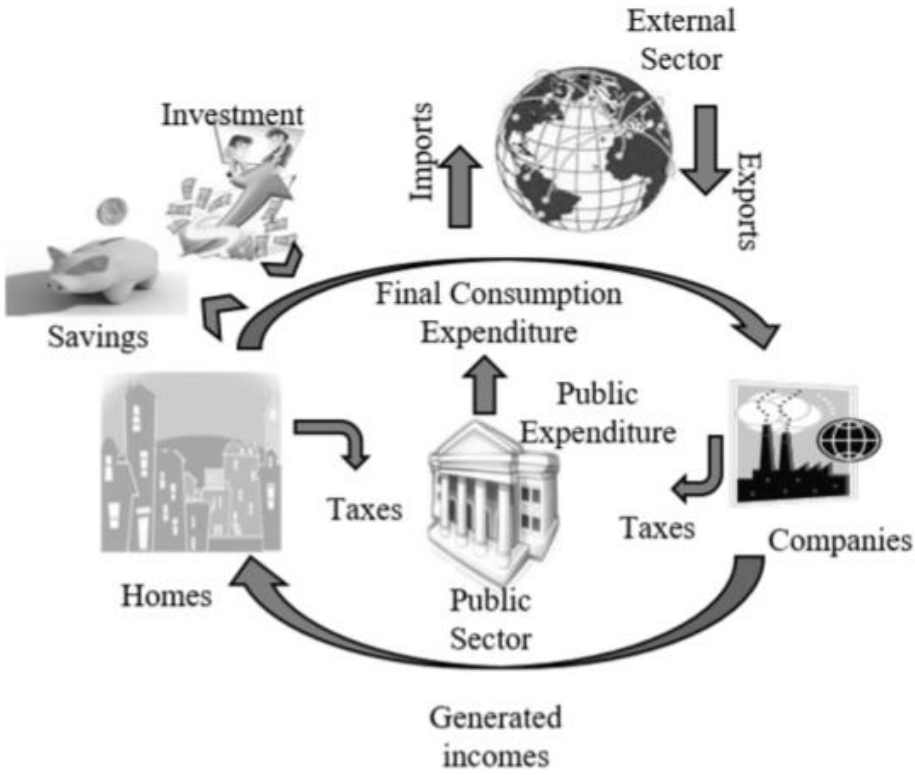

Figure 2: Circular Income Flows Represented in a Social Accounting Matrix (authors' elaboration)

SAMs, as mentioned, have their origin in the integration of social statistics with the Input-Output Model of the interdependence of productive sectors, representing in a matrix form an extension of these models. In the methodology that we apply here, the Leontief Model is extended to linear SAM models to evaluate changes in production, income, or employment in endogenous accounts by means of the policies that modify these accounts for the productive branches of the Andalusian economy. These methods are based on obtaining information, according to the inverse matrices derived from the Leontief and Gosh models applied to SAM, on the capacity of a sector to expand demand or cost increases, respectively (Defourny & Thorbecke, 1984; Pyatt & Round, 1979; Stone, 1985).

Starting from an nxn square matrix, we consider that each row and column stands for an economic account (including all productive sectors plus accounts for consumers, government, and capital). This matrix must meet with the accounting equations of the economy (where total expenditure equals total income) so that each Yij component of the matrix represents the bilateral flow between account i and account j. Each column, therefore, shows the total income of column j and how it is distributed among the different i rows while each row reflects the total income that row i receives from column j. Consequently, the average expenditure coefficients (defined as aij where aij= Yij / Yj) determine payments made to account i for every income unit of j.

From this definition, it is possible to obtain the following:

$$Y_i = \sum_{J=1}^{n} \left({}^{Y_{ij}}\!/_{Y_i} \right) Y_j = \sum_{j=1}^{m} a_{ij} Y_j + \sum_{j=m+1}^{m+k} a_{ij} Y_J \qquad \text{n=m+k} \qquad (1)$$

Indexes m and k represent the division of the SAM accounts into endogenous (value of goods produced, output from activities, payment from factors, and income of households) and exogenous (public administration, capital variations, and the rest of the world) accounts (Bellù, 2012). This leads to the division of the nxn matrix into four submatrices: A_{mm}, A_{mk}, A_{km}, and A_{kk}. Y_m and Y_k, on the other hand, show the total income of the endogenous and exogenous accounts, respectively. Thus, it is possible to work out the value of Y_m from $Y_m = A_{mm} Y_m + A_{mk} Y_k$ and then, following the same procedure as with the Leontief equation, calculate the extended multipliers matrix from $Y_m=(I-A_{mm})-_1Z$, where Z is the vector of exogenous accounts and (A_{mk} Y_k) and $M=(I-A_{mm})^{-1}$ make up the extended multipliers matrix in the SAM. These multipliers can then be interpreted as the input requirements by unit increases of expenditure or income in an account (depending on whether columns or rows are considered), similar to how it is in the so-called inverse Leontief matrix but with the difference that this matrix reflects the relationship between production, factor income, income distribution, and final demand.

The methodology is therefore based on the combination of two types of intersectoral links called Backward Linkages (BL) and Forward Linkages (FL). The first ones (BL) provide information on the effect of a sector's increasing demand in the economy, i.e., where the inputs that a sector requires to increase its production come from. The FLs, on the other hand, offer information about the effect in other

sectors of change in the value of primary inputs and, therefore, in the production of a specific sector, i.e., what is the destination of the production of a sector and to what extent the variation in its valuation affects the rest.

This model is a clear example of the advantages of SAM analysis over the traditional input-output approach, particularly given that IOTs do not consider the interdependencies that are present in the circular flow of income, factors that SAMs incorporate (Pyatt, 1999). This also allows for assessment of the effects derived from the circular flow of income (for example, the effect of a change in income on levels of activity, called induced effects) (Lewis & Thorbecke, 1992).

To carry out this research, a multisectoral model specifically representing the Andalusian economy was used. A vector calculating the shock that entrepreneurial (start-up) activity would involve for the economic activity in Andalusia was also elaborated, along with an estimation of the shock that would suppose for the same economy if a percentage of these start-ups were to be transformed into scale-ups. An impact analysis using SIMSIPSAM[2] software on the production of the economy as a whole, on the Gross Domestic Product (GDP), and on employment in the region was also carried out.

DATA

Social Accounting Matrix for Andalusia 2014 (SAMAND14)

Using SAMAND14, the empirical application made using the SAM built for Andalusia for the year 2014 (Campoy, Cardenete, & Delgado, mimeo, 2016), instead of appealing directly to the IOT is justified because it enables a more disaggregated structure of expenditure and income, integrating relationships between institutional sectors that have been estimated with information from national accounting systems. In this way, the objective of closing the full economic flow is achieved. SAM, therefore, is a consistent framework, gathering national income data, product

[2]SIMSIPSAM stands for Simulation for Social Indicators and Poverty using Social Accounting Matrices. It is a software tool developed by the World Bank (Parra & Wodon, 2009) based on a Microsoft Excel application in MATLAB. It can be used to analyze Input-Output and SAM tables, perform various types of analysis and decomposition, and obtain detailed results and graphs for different simulations.

accounts, and an Input-Output table, one that also reflects monetary flows between institutions.

SAMAND was built from the symmetric tables of the last Input-Output Framework for Andalusia in 2010 (MIOAN10[3]) as published by the Institute of Statistics and Cartography of Andalusia (IECA) and updated for 2014. Since goods and services accounts have been joined together with production accounts in the SAMAND14, a table with the same level of detail by rows and columns was required. MIOAN10 was thus chosen because it is the only table that introduces homogeneous branches in rows and columns. Nevertheless, while most of the information was built in from this table, other statistical sources, such as the Spanish Regional Accountancy published by the Spanish National Institute of Statistics (INE), were also used to complete the information.

Referring to the degree of disaggregation by activity sector of the matrix, SAMAND14 works with a matrix divided into 37 accounts for productive sectors, two for productive factors (labor and capital), one for savings/investment, and seven additional accounts for institutional sectors, included among which are the consumer, Public Administration, different taxes considered, and Foreign Sector accounts. This structure is based on the last one published by IECA (Cardenete, Fuentes, Mainar, & Rodríguez-Morilla, 2015) as shown in Table 2.

PRODUCTIVE SECTORS	
1	Agriculture, forestry, and fishing
2	Extractive industries
3	Food, beverage, and tobacco industries
4	Textile industry, garment manufacturing, leather and footwear industry
5	Wood and cork industry, paper industry and graphic arts
6	Oil refining and treatment of nuclear waste
7	Chemical industry
8	Manufacture of pharmaceutical products
9	Manufacture of rubber and plastics products and other non-metallic mineral products
10	Metallurgy and metal products manufacturing, except machinery and equipment
11	Manufacture of computer, electronic, and optical products
12	Manufacture of electrical equipment and materials

[3]MIOAN10 stands for Marco Input-Output en Andalucia 2010.

PRODUCTIVE SECTORS	
13	Manufacture of machinery and equipment
14	Manufacture of transport equipment
15	Furniture manufacturing; Other manufacturing industries and repair and installation of machinery and equipment
16	Electricity, gas, steam, and air conditioning supply
17	Water supply; Sanitation, waste management, and decontamination activities
18	Building
19	Wholesale and retail; Repair of motor vehicles and motorcycles
20	Tourism
21	Storage, transport, and communications activities
22	Publishing, audio visual, and broadcasting activities
23	Telecommunications
24	Programming, consultancy, and other activities related to information technology; Information services
25	Financial, insurance, and auxiliary services
26	Legal and accounting activities; Business management consultancy activities; Architectural and engineering technical services
27	Research and development
28	Advertising and market research; Other professional, scientific, and technical activities; Veterinary activities
29	Activities related to employment
30	Security and research activities; Services to buildings and gardening activities
31	Office administrative activities and other activities auxiliary to enterprises
32	Public administration and defence
33	Education
34	Health activities
35	Social service activities
36	Other services
37	Activities of households as employers of domestic personnel or as producers of goods and services for their own use
INSTITUTIONAL SECTORS	
38	Labour
39	Capital
40	Consumption
41	Social security contributions paid by employers
42	Indirect taxes

INSTITUTIONAL SECTORS	
43	Direct taxes
44	Social security contributions paid by employees
45	Public sector
46	Savings/investment
47	Foreign sector

Table 2: Structure of SAMAND14 (Campoy et al., 2016)

Entrepreneurial Activity and Scale-ups in Andalusia in 2014

Our starting point in estimating entrepreneurial activity in Andalusia for 2014 was to determine the number of start-up companies in the region, considering both those recently created and those already at three years old in accordance with the TEA rate (Cardenete & Garcia-Tapial, 2018). As such, we have

$$E_{ae} = E_{nc} + E_{nu} \qquad (2)$$

where E_{ae} is the total number of start-up companies, E_{nc} is the total number of new firms for one year, and E_{nu} is the number of companies that are up to three years old.

We then estimated the productive output associated with these companies. Given the clear relationship between productivity and the age of a firm (De Kok, Fris, & Brouwer, 2006), that the productivity level of start-ups is lower than the average productivity of their sector (Jensen, McGuckin, & Stiroh, 2001), and that productivity increases as the size of the company increases (Taymaz, 2005), we assumed that 75% of the output of each productive sector corresponds to companies with more than 20 employees and 25% to companies with fewer than 20 employees. This is because the productivity of large companies (those with more than 1,000 employees) in Spain is at least three times higher than the productivity of companies with fewer than 20 employees (INE, 2013). As such, we have

$$O_p = O_t * 0.25 \qquad (3)$$

with O_p being the total productive output for companies with fewer than 20 employees and O_t being the total output for the productive sector.

Lastly, given that 98% of Andalusian companies have 20 or fewer employees (IECA, 2019), we considered it to be 98% probable that start-ups will have fewer than 20 employees and that their productivity will match those kinds of firms as a result. The output of start-up companies, therefore, is as follows:

$$O_{AE} = \Sigma\, O_p \times (E_{ae} / E_p) \qquad (4)$$

where O_{AE} is the productive output for start-ups and E_p is the number of companies with fewer than 20 employees.

The productive output vector corresponding to start-ups in Andalusia for 2014 was thus obtained based on these calculations and used to estimate the economic impact of these companies as shown in Table 3.

PRODUCTIVE SECTORS	O_{AE}
Extractive industries	19.240,56 €
Food, beverage, and tobacco industries	555.375,88 €
Textile industry, garment manufacturing, leather and footwear industry	74.092,38 €
Wood and cork industry, paper industry and graphic arts	774.562,63 €
Chemical industry	22.326,43 €
Manufacture of pharmaceutical products	171.593,32 €
Manufacture of rubber and plastics products and other non-metallic mineral products	245.400,86 €
Metallurgy and metal products manufacturing, except machinery and equipment	15.607,11 €
Manufacture of computer, electronic, and optical products	70.477,48 €
Manufacture of electrical equipment and materials	30.557,10 €
Manufacture of machinery and equipment	115.887,63 €
Manufacture of transport equipment	82.739,31 €
Furniture manufacturing; Other manufacturing industries and repair and installation of machinery and equipment	515.516,32 €
Electricity, gas, steam, and air conditioning supply	3.485,18 €
Water supply; Sanitation, waste management, and decontamination activities	794.369,85 €
Building	1.334.895,50 €
Wholesale and retail; Repair of motor vehicles and motorcycles	3.545.028,98 €
Tourism	299.007,92 €
Storage, transport, and communications activities	63.980,52 €

PRODUCTIVE SECTORS	O_{AE}
Publishing, audio visual, and broadcasting activities	276.471,77 €
Telecommunications	138.660,28 €
Programming, consultancy, and other activities related to information technology; Information services	755.392,02 €
Financial, insurance, and auxiliary services	453.389,91 €
Legal and accounting activities; Business management consultancy activities; Architectural and engineering technical services	35.981,81 €
Research and development	109.809,44 €
Advertising and market research; Other professional, scientific, and technical activities; Veterinary activities	32.190,29 €
Activities related to employment	215.490,43 €
Security and research activities; Services to buildings and gardening activities	80.121,98 €
Office administrative activities and other activities auxiliary to enterprises	1.412.882,19 €
Education	786.353,94 €
Health activities	680.746,23 €
Social service activities	125.517,03 €
Other services	257.286,66 €
TOTAL	14.094.438,94 €

Table 3: Productive Output for Start-ups in Andalusia in 2014 (thousands of euros; authors' elaboration using data from SAMAND14, INE, and IECA)

Given this productive output consequence of start-up activity, we chose to work with the following three hypotheses.

Hypothesis 1: Start-up companies have a greater impact on the regional economy than do start-ups that become scale-ups.

We first attempted to show that the creation of "traditional" new ventures has a greater effect on the economy than do scale-ups despite the benefits of the latter. To do so, the impact that scale-ups would have on the Andalusian economy in terms of GDP, productive output, and job creation if 10% of start-ups would transform into scale-ups (and therefore increase their turnover by 20% for three consecutive years) was calculated; such an impact was then compared with the impact that start-up companies have as a whole. We regarded this as a reasonable percentage with which

to compare both sets of companies considering that there is no evidence of a country where scale-ups account for more than 10% of companies. In the Netherlands, for example, only 5–6% of companies are scale-ups, and that proportion increased to only 7% in 2018 (Jensen, 2019). In the United Kingdom, they represent 7% of all start-ups, with an average annualised growth rate of 9.3% between 2013 and 2016 (ScaleUp Institute, 2019).

Hypothesis 2: The effort required to make the economic impact of scale-ups comparable to that of start-ups is very large.

We also attempted to prove that the number of start-ups that would have to become scale-ups to produce economic impact comparable to start-ups alone is so high that supporting a public policy strategy focused only on scale-ups instead of on start-ups would be unrealistic, particularly because the results would never be the same in terms of economic impact, at least in the short term. To do this, we calculated what percentage of start-ups needs to be transformed into scale-ups such that their economic impact would become similar to that which occurs right now with start-up activity alone.

This hypothesis is especially relevant for analyzing policy decisions as it is easier for a venture to become a scale-up in its first years rather than remain a start-up as it grows. Scale-ups are more readily found, therefore, among small firms rather than in medium or large-sized companies (da Rosa et al., 2018; Isenberg, 2012; Isenberg & Onyemah, 2016).

Hypothesis 3: The impact of start-ups on the economy is similar to that of scale-ups.

Lastly, we attempted to explain how the effects of start-ups are similar to those of scale-ups (regardless of when they were established). To that end, we calculated the effects on the economy if 2% and 5% of the total companies in each activity sector became scale-ups, and then compared these to the effect of start-ups.

IMPACT ANALYSIS AND RESULTS

As a starting point for all these hypotheses, we estimated the economic impact of start-ups in Andalusia in 2014 based on the demand shock that these companies

produced on the regional economy. This shock is due to the productive output associated with their activity (O_{AE}), distributed according to productive sectors, as shown in Table 3.

To test our first hypothesis, i.e., what would happen if 10% of start-ups in Andalusia were transformed into scale-ups, we needed to know the productive output vector of these companies for 2014. We thus calculated how many firms corresponded to 10% of start-up companies, what their average turnover would be (according to productivity sector and based on productivity information provided by the INE), and what their turnover at the end of the third year would be if they were to act as a scale-up (i.e., with a 20% increase in turnover every year). The result is the productive output vector shown in Table 4.

PRODUCTIVE SECTORS	O_{SU}
Extractive industries	3.324,77 €
Food, beverage, and tobacco industries	95.968,95 €
Textile industry, garment manufacturing, leather and footwear industry	12.803,16 €
Wood and cork industry, paper industry and graphic arts	133.844,42 €
Chemical industry	3.858,01 €
Manufacture of pharmaceutical products	29.651,33 €
Manufacture of rubber and plastics products and other non-metallic mineral products	42.405,27 €
Metallurgy and metal products manufacturing, except machinery and equipment	2.696,91 €
Manufacture of computer, electronic, and optical products	12.178,51 €
Manufacture of electrical equipment and materials	5.280,27 €
Manufacture of machinery and equipment	20.025,38 €
Manufacture of transport equipment	14.297,35 €
Furniture manufacturing; Other manufacturing industries and repair and installation of machinery and equipment	89.081,22 €
Electricity, gas, steam, and air conditioning supply	602,24 €
Water supply; Sanitation, waste management, and decontamination activities	137.267,11 €
Building	230.669,94 €
Wholesale and retail; Repair of motor vehicles and motorcycles	612.581,01 €
Tourism	51.668,57 €
Storage, transport, and communications activities	11.055,83 €

PRODUCTIVE SECTORS	O_{SU}
Publishing, audio visual, and broadcasting activities	47.774,32 €
Telecommunications	23.960,50 €
Programming, consultancy, and other activities related to information technology; Information services	130.531,74 €
Financial, insurance, and auxiliary services	78.345,78 €
Legal and accounting activities; Business management consultancy activities; Architectural and engineering technical services	6.217,66 €
Research and development	18.975,07 €
Advertising and market research; Other professional, scientific, and technical activities; Veterinary activities	5.562,48 €
Activities related to employment	37.236,75 €
Security and research activities; Services to buildings and gardening activities	13.845,08 €
Office administrative activities and other activities auxiliary to enterprises	244.146,04 €
Education	135.881,96 €
Health activities	117.632,95 €
Social service activities	21.689,34 €
Other services	44.459,13 €
TOTAL	2.435.519,05 €

Table 4: Productive Output if 10% of Start-ups Turned into Scale-ups, 2014 (thousands of euros; authors' elaboration based on data from SAMAND14, INE, and IECA)

Table 5 shows the results obtained in terms of total production (productive output) and regional GDP. The increase in demand generated by the activity of start-ups had positive effects both on total production and on regional GDP, involving an average increase in the regional economy of 10.84% in terms of total production and 11.11% in terms of GDP. The effect resulting from the potential activity of scale-ups, however, assuming that these were 10% of start-ups, was only 1.87% out of the total production increase and 1.92% out of the regional GDP increase.

	INCREASE FOR START-UPS	INCREASE FOR SCALE-UPS (IF 10% OF START-UPS)
Total Production	10.84%	1.87%
Regional GDP	11.11%	1.92%

Table 5: Effects on Total Production and Regional GDP (authors' elaboration)

In terms of global economic impact, the demand shock derived from the activity of start-ups translated into an increase of €28,415,791 in Andalusian production and €15,991,762.73 for the regional GDP for 2014. The demand shock derived from the activity of potential scale-ups under our hypothesis, on the other hand, would result in an increase of €4,910,248.79 in Andalusian production and €2,763,376.60 for regional GDP for 2014. These results support our first hypothesis, i.e., that the activity of start-ups as a whole has a greater impact on the regional economy than that of scale-ups under the assumption that these latter are only 10% of the total number of start-ups. This finding is important, particularly given that some authors over the last years have argued that a very small number of high-growth ventures may be sufficient to generate almost all of the social and economic benefits of entrepreneurship (Isenberg, 2012).

With regard to our second hypothesis, we calculated the percentage of start-up companies that needed to transform into scale-ups for their economic impact to be the same as that currently enjoyed by start-ups, namely, an average increase in the regional economy of 10.84% in terms of total production and 11.11% in terms of GDP. The result showed that 58% of start-ups needed to transform into scale-ups in their first three years of life. This data thus confirms our second working hypothesis, i.e., that a very large effort is required to have the activity of scale-ups generate the same impact that start-ups currently have.

To test our third hypothesis, we estimated what the productive output per activity sector would be if 2% of the ventures in them increased their turnover by 20% every year for three consecutive years (i.e., 2% of the ventures became scale-ups). This was in consideration of the fact that scale-up companies account for around 1% of all registered business organizations worldwide (Isenberg, 2012) and for around 2% of registered businesses in the United States, considered to be the country with a higher percentage of scale-ups (Clayton, Sadeghi, Spletzer, & Talan, 2013). What would happen, in addition, if the same occurred with 5% of the ventures in each activity sector? The resulting productive output vectors are shown in Table 6.

PRODUCTIVE SECTORS	O_{SU1}	O_{SU2}
Extractive industries	22.181,82 €	55.454,54 €
Food, beverage, and tobacco industries	634.146,27 €	1.585.365,68 €
Textile industry, garment manufacturing, leather and footwear industry	39.708,92 €	99.272,30 €
Wood and cork industry, paper industry and graphic arts	584.551,99 €	1.461.379,97 €
Chemical industry	16.183,58 €	40.458,96 €
Manufacture of pharmaceutical products	89.665,61 €	224.164,02 €
Manufacture of rubber and plastics products and other non-metallic mineral products	275.414,63 €	688.536,56 €
Metallurgy and metal products manufacturing, except machinery and equipment	11.205,77 €	28.014,42 €
Manufacture of computer, electronic, and optical products	42.044,49 €	105.111,22 €
Manufacture of electrical equipment and materials	24.211,15 €	60.527,87 €
Manufacture of machinery and equipment	118.441,89 €	296.104,72 €
Manufacture of transport equipment	76.794,43 €	191.986,07 €
Furniture manufacturing; Other manufacturing industries and repair and installation of machinery and equipment	343.601,26 €	859.003,14 €
Electricity, gas, steam, and air conditioning supply	111.968,28 €	279.920,71 €
Water supply; Sanitation, waste management, and decontamination activities	697.408,95 €	1.743.522,36 €
Building	928.819,87 €	2.322.049,68 €
Wholesale and retail; Repair of motor vehicles and motorcycles	1.864.666,28 €	4.661.665,69 €
Tourism	169.640,11 €	424.100,28 €
Storage, transport, and communications activities	39.936,29 €	99.840,73 €
Publishing, audio visual, and broadcasting activities	134.723,00 €	336.807,50 €
Telecommunications	45.897,44 €	114.743,61 €
Programming, consultancy, and other activities related to information technology; Information services	272.483,62 €	681.209,05 €
Financial, insurance, and auxiliary services	244.431,99 €	611.079,98 €
Legal and accounting activities; Business management consultancy activities; Architectural and engineering technical services	29.781,01 €	74.452,52 €
Research and development	48.705,68 €	121.764,21 €

PRODUCTIVE SECTORS	O_{SU1}	O_{SU2}
Advertising and market research; Other professional, scientific, and technical activities; Veterinary activities	13.200,68 €	33.001,69 €
Activities related to employment	82.971,31 €	207.428,27 €
Security and research activities; Services to buildings and gardening activities	41.972,91 €	104.932,28 €
Office administrative activities and other activities auxiliary to enterprises	519.072,68 €	1.297.681,69 €
Education	347.512,79 €	868.781,98 €
Health activities	366.240,06 €	915.600,15 €
Social service activities	111.759,47 €	279.398,68 €
Other services	120.577,01 €	301.442,52 €
TOTAL	8.469.921,23 €	21.174.803,07 €

Table 6: Productive Output if 2% and 5% of Start-Ups Turned Into Scale-Ups in 2014 (thousands of euros; authors' elaboration based on data from SAMAND14, INE, and IECA)

Table 7 shows the impact of these output vectors in terms of total production (productive output) and regional GDP, along with how they compare with the effect of start-up activity. If 2% of companies became scale-ups, the economic impact would be less than that of start-up firms; however, if 5% of companies became scale-ups, their economic effect would be higher than that of start-ups.

	INCREASE FOR START-UPS	INCREASE IF X% OF COMPANIES BECAME SCALE-UPS	
		2%	5%
Total Production	10.84%	6.21%	15.66%
Regional GDP	11.11%	6.35%	15.97%

Table 7: Effects on Total Production and Regional GDP (authors' elaboration)

It is also interesting to note the effect of start-up activity on employment creation and compare it with what would happen if 2% and 5% of companies became scale-ups. These results are shown in Table 8.

PRODUCTIVE SECTORS	INCREASE FOR START-UPS (%)	INCREASE IF X% OF COMPANIES BECAME SCALE-UPS (%)	
		2%	5%
Agriculture, forestry, and fishing	6,303	3,966	9,972
Extractive industries	357	315	790
Food, beverage, and tobacco industries	4,509	3,586	8,997
Textile industry, garment manufacturing, leather and footwear industry	1,509	835	2,095
Wood and cork industry, paper industry and graphic arts	910	647	1,618
Oil refining and treatment of nuclear waste	156	89	224
Chemical industry	4,343	2,826	7,087
Manufacture of pharmaceutical products	116	61	153
Manufacture of rubber and plastics products and other non-metallic mineral products	746	725	1,813
Metallurgy and metal products manufacturing, except machinery and equipment	17,678	12,455	31,179
Manufacture of computer, electronic, and optical products	277	151	377
Manufacture of electrical equipment and materials	597	404	1,011
Manufacture of machinery and equipment	307	278	696
Manufacture of transport equipment	966	728	1,824
Furniture manufacturing; Other manufacturing industries and repair and installation of machinery and equipment	1,831	1,198	2,997
Electricity, gas, steam, and air conditioning supply	1,390	979	2,461
Water supply; Sanitation, waste management, and decontamination activities	1,185	976	2,443
Building	8,258	5,677	14,197
Wholesale and retail; Repair of motor vehicles and motorcycles	49,556	26,707	66,955
Tourism	321,368	179,780	452,860
Storage, transport, and communications activities	6,156	3,498	8,781
Publishing, audio visual, and broadcasting activities	1,094	544	1,362
Telecommunications	3,671	1,732	4,351
Programming, consultancy, and other activities related to information technology; Information services	2,081	772	1,929

PRODUCTIVE SECTORS	INCREASE FOR START-UPS (%)	INCREASE IF X% OF COMPANIES BECAME SCALE-UPS (%)	
		2%	5%
Financial, insurance, and auxiliary services	12,755	7,056	17,718
Legal and accounting activities; Business management consultancy activities; Architectural and engineering technical services	29,661	17,662	44,275
Research and development	1,195	530	1,325
Advertising and market research; Other professional, scientific, and technical activities; Veterinary activities	13,575	7,019	17,598
Activities related to employment	1,261	515	1,288
Security and research activities; Services to buildings and gardening activities	30,188	16,374	41,085
Office administrative activities and other activities auxiliary to enterprises	3,365	1,279	3,198
Education	18,379	8,391	21,004
Health activities	11,406	6,192	15,509
Social service activities	3,518	2,787	6,981
Other services	27,727	14,176	35,590
Activities of households as employers of domestic personnel or as producers of goods and services for their own use	14,659	8,216	36,949
TOTAL	603,051	339,124	868,692

Table 8: Employment Creation (authors' elaboration based on 2014 data from SAMAND14, INE, and IECA)

Once again, while the impact on employment is higher for start-up activities than it would be if 2% of companies in each activity sector became scale-ups, it is smaller for start-up activities if said percentage is increased to 5%.

CONCLUSIONS

The importance of entrepreneurship as a driving force for economic activity and as a source of employment has already been recognized by the academic community as well as by the political and business world. This value has increased in recent years, moreover, due to the global economic crisis and the need to generate employment, something which entrepreneurship contributes to by generating jobs for both the

entrepreneur and the people whom she or he hires, as this research shows. Public institutions and policymakers, however, have long been debating the importance of supporting scale-ups instead of start-ups, especially given the former's supposed impact on the economy and employment generation. The challenge that these institutions face is to ask themselves whether to continue giving resources to new ventures (with the risk that many start-ups do not last beyond five years) or start focusing on companies that have already demonstrated a basis for continued growth.

In this light, our research study compared the economic impact of start-ups with the potential economic impact of scale-ups. The results showed that although scale-ups have proportionally greater economic impact, the risk of ceasing support for start-up companies and shifting focus to scale-ups is high given the probability that scale-ups as a whole will not have enough economic impact to replace that generated by new ventures. Such a decision will probably do the economy more harm than good.

Supporting scale-ups, moreover, does not guarantee a better survival rate for companies during an economic crisis. Resilience has usually been related to a company's organizational structure, financial capacity (Vargo & Seville, 2011), relationship with the market (Sabatino, 2016), and, above all, ability to innovate (Salavou, Baltas, & Lioukas, 2004). Resilience factors can also vary on many occasions depending on a firm's sector of activity (Starr, Newfrock, & Delurey, 2003). Indeed, among the few studies that relate company growth with resiliency, no evidence has been found indicating that high growth increases a firm's chances of survival (Hölzl, 2014).

Despite all these facts, however, the impact of total start-up activity on both production and employment would be equalized if a number of companies—between 2% and 5%, including both start-ups and already established firms—became scale-ups. This evidence supports the current trend among policymakers to stimulate scale-ups to the same extent as is done for entrepreneurship.

We believe, though, that remaining a scale-up is an enormous challenge for companies. The difficulties can be explained easily by comparing percentage growth criteria wherein high growth is defined relative to the firm's turnover in the previous period. In this sense, it is much easier for a company to become a scale-up in its early days than it is to remain one throughout its existence (Isenberg & Onyemah,

2016). In fact, some studies show that surviving high-growth firms are characterized by negative future growth rates (Erhardt, 2018).

Growth is a challenge as well for Andalusian SMEs. The region suffered the effects of the economic recession of 2008–2013 with more intensity compared to the rest of Europe, and its recovery has been less than stellar due to some differentiating local factors such as the low social relevance of being an entrepreneur, the asymmetric effects of the welfare state, and the role of the public administration which takes the center stage away from private initiative (Ferraro & Mesa, 2016). Employers, in addition, consider the regulatory framework of most economic sectors as always changing and unclear (Pérez, 2018). As a result of this, the main barriers to growth for small Andalusian enterprises are the submerged economy and three interrrelated factors: the dispersion of regulations existing in Spain, taxation, and the distortion of the market unit, all of which are the consequences of having different regulations in different parts of the country. The weakness of domestic demand, moreover, is also a factor that negatively influences the growth process (Garcia-Tapial & Crespo, 2017).

There are some limitations to our research, however. First, the concept of entrepreneurs associated with venture creation cannot be used in developing countries due to the prevalence of informal entrepreneurship in those regions (Williams, Martinez-Perez, & Kedir, 2017). Not all these business ventures register and declare some or all of their production and/or sales to the authorities, making it impossible to obtain actual facts on entrepreneurial activity. Second, our research does not take into account firm size in terms of turnover prior to its growth, although studies have consistently found that growth is systemically related to the age and size of a firm (Choi, Rupasingha, Robertson, & Leigh, 2017). As previously noted, this has led some authors to establish a minimum turnover threshold for a company to be considered a scale-up (Jensen, 2017).

This paper also notes two new possible lines of development for future research. On the one hand, it would be interesting to expand the investigation into determining the actual importance of scale-ups in a regional economy as a whole, particularly since there are hardly any statistics that reflect the percentage of companies existing in a country or region that can be considered as scale-ups (due to, among other reasons, there being still no consensus regarding the definition of such). On the other hand, it would also be necessary to work on factors that

stimulate a start-up to become a scale-up, especially given that public policies related to entrepreneurship should be oriented toward favoring these factors alongside the promotion of start-ups. Scaling-up is a concept that has come to stay in the field of entrepreneurship; the challenge is to balance it with traditional start-up activity. Lastly, there are only a few studies that analyze the cost of developing a scale-up vs. that of developing a start-up and which are intended for use by policymakers. Current data collection efforts are incomplete and unbalanced, making any research on this topic very valuable indeed (Hellmann & Kavadias, 2016).

Policymakers can employ three broad approaches to stimulate an entrepreneurial environment (Wilson & Silva, 2013). First, they can set the regulatory framework that defines the broad parameters of economic activity (e.g., rule of law, macro-economic stability, regulation, taxation, etc.). The European Commision, for instance, is promoting initiatives for the creation of an environment that is conducive to innovation and entrepreneurship among its member states (European Commission, 2016). Second, governments can use public policies to stimulate the demand side, thereby promoting entrepreneurship and encouraging innovation. This is because most public programmes are currently focused on younger and smaller companies and are thus inappropriate for addressing the needs of scale-ups (Hellmann & Kavadias, 2016). Lastly, governments can also use public policies to stimulate the supply side, thereby fostering investments into entrepreneurial companies themselves. The Organisation for Economic Co-operation and Development (OECD), for example, recommends that, "given the increasing reliance on public sector funding in the seed and early stage market, more emphasis should be put on initiatives to attract institutional investors as well as on various equity risk-sharing arrangements between public and private investors" (Wilson & Silva, 2013). Taking into consideration the growing importance of scale-ups, then, these three areas should thus be reconsidered and formulated.

The overall challenge for public authorities at present is to use scarce public resources in a profitable and intelligent manner. This means that policies need to be designed for economic impact on short-term development in addition to having medium and long-term vision. It is necessary, therefore, to implement economic strategies at the regional level that foster the creation of companies (start-ups) and which also have policies aimed at the rapid growth of ventures (scale-ups). A simple metaphor to describe this phenomenon, the term scale-up evokes growth and allows

the modulation of entrepreneurially-oriented policies. At the end of the day, there truly is no entrepreneurship without growth.

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