Chapter 16
Building a Statistical System on Entrepreneurship: a Theoretical Framework

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Abstract The search for a systematic set of indicators to measure the crucial dimensions of the entrepreneurship in relation to its diagnosis, forecast and tracking, has become a very first need for both the economic analysis progress, as well as to obtain an appropriate design, monitoring and evaluation of the public policies.

The main contribution of this study is to present a theoretical framework of reference that may be used as foundation to articulate a statistical subsystem of entrepreneurship indicators, a conceptual general framework that nourishes from the contributions and results, which are the core of the Economics of Entrepreneurship, and that allows us to determine the key dimensions and aspects to be captured by the system.

16.1 Introduction

The search for a systematic set of indicators to measure the crucial dimensions of the entrepreneurship in relation to its diagnosis, forecast and tracking, has become a very first need for both the economic analysis progress, as well as to obtain an appropriate design, monitoring and evaluation of the public policies. Thus, the increasing importance of the entrepreneurial promotion policy in the European area,[1] has a logical inference of starting different kinds of actions to implement this type of statistical information subsystems.

We can appeal to a comparison analysis to show the novelty characteristic of this kind of statistical information. Based on this analysis, we can confirm the short number of institutions and agencies that have real entrepreneurship statistical subsystems, showing important methodological differences among them. This way, at present agencies that implement entrepreneurship statistical systems coexist with

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[1] Proof of this statement is the set of objectives derived from the Lisbon Council 2000. These objectives explicitly defend the entrepreneurial promotion policy as a foundation for basing the European Union's growing and employment strategy for 2010.

other agencies that have developed competitiveness subsystems.[2] In these subsystems, entrepreneurship and its dimensions are configured as one of the decisive factors of competitiveness, while the most common fact derives from those agencies that only make some isolated statistical operations, used to try to capture some inner dimensions and aspects of the entrepreneurship.

As starting point, we could wonder about the reason of this situation, we would wonder why the statistical operations designed to measure the entrepreneurship are scanter, and even scanter are the attempts to systemize statistical information. In other words, why a similar statistical development level between labour market analysis and entrepreneurial analysis does not exist?

This situation is, in some extent, logical if we take into account two premises: i) firstly, the economic analysis of entrepreneurship has not been –until recently- a central subject in Economics, which has been translated in a short number of models and theoretical propositions, ii) secondly, the absence of a common framework for analysis implies very different approaches. Consequently, dimensions, indicators and proxies used in research are difficult to be implemented in the same statistical information subsystem.

However, the increasing entrepreneurship integration in Economics through the use of proper models of Labour Economics, the appearing of propositions more robust and verified and the increasing importance of the entrepreneurial promotion policy in the politic action agenda –under the premise that its promotion is an effective way to achieve the economic growth and competitiveness objectives-, imply the following: i) the theoretical framework clarification, with the first efforts to synthesize, and ii) from the statistical point of view, the increasing demand on information and the pioneering efforts to make systematized statistical operations, for them to create entrepreneurship statistical subsystem.[3] In this sense, the search for indicators, and even the articulation of specific statistics have become a crucial need to make a progress in applied research, and in order to design, implement, and assess the different instruments of public intervention on this subject. Thus, the development of a set of indicators that allow satisfactorily capture the different dimensions of the entrepreneurial network for a specific sector or territory –either by using already existing statistical operations, either by implementing new ones- becomes a basic element to favour the progress in entrepreneurship analysis, forecast, and monitoring.

Although analysts, and the agencies themselves have implemented specific statistical operations to measure the entrepreneurial dynamics, and even its stock, those have not been considered as a statistical system, but a set of incoherent operations used to attempt immediately satisfying the increasing demand on entrepreneurial information. This way, and for a short time ago, the only progress in the articulation

[2] We can compare, for instance, the Danish Entrepreneurship Index vs. the Competitivity Index of the British Treasure.

[3] We refer here to projects, such as the OECD Entrepreneurship Indicators Project or the pioneering effort of FORA (Denmark).

of indicators -with a certain dose of comparability-, has been associated with both the quantitative aspect measurement of the entrepreneurship, and the creation of Structural Business Statistics.

Therefore, the increasing demand on statistical information about the entrepreneurship, and its actions results, together with the real status of the statistical operations related to entrepreneurship, advice the design and implementation of real statistical information systems on entrepreneurship, for which the dimensions and variables to be captured are determined by some kind of theoretical framework that allows determining which existing statistical operations may be used to propose indicators that help to capture the key dimensions, which ones should be modified for the system objectives, and if no covered dimensions exists that advice the implementation of new statistical operations. Those tasks must have the necessary dose of comparability, which means that they have to be articled based on the use of common methodologies to obtain indicators that should be integrated in the system.

Due to the special features, and the current status of this research subject, the main task may be the articulation of a theoretical framework, and more urgent, to be able to identify unequivocally the dimensions and aspects to be captured by the system, as well as to guarantee the comparability of the systems to be articled in the future. That is why we believe that any proposal to measure entrepreneurship must be established within an orthodox conceptual framework,[4] and must tend to the same international ongoing experiences. In other words, to establish the key dimensions and variables that allow us to capture the entrepreneurship, and the different consequences of its economic actions, we must use the core of the propositions stemmed from the theoretical research on entrepreneurship. We should also take into consideration the most consolidated elements of the implemented or under study statistical subsystems. The main contribution of this study is exactly this: presenting a theoretical framework of reference that may be used as foundation to articulate a statistical subsystem of entrepreneurship indicators, a conceptual general framework that nourishes from the contributions and results, which are the core of the Economics of Entrepreneurship, and that allows us to determine the key dimensions and aspects to be captured by the system.

The chapter structure is in accordance to the proposed theoretical framework itself. Therefore, in Section 2, entrepreneurship is conceptually delimited, and we argue about the need to distinguish entrepreneurship and its determinants from its action results. Once this task is carried out, in Section 3, the model is analysed. In this model, dimensions and variables to be captured by the system derive from determinant factors of entrepreneurship supply and demand, from the entrepreneurial activity itself, and lastly, from this market interrelations to other variables and markets. Finally, in Section 4, we summarize and introduce the dimensions and variables to be configured by the analysed system.

[4] This statement should not be understood in terms of rejection of other kind of approaches validity, but as the most operative way to reach a consensus on a theoretical framework of reference.

16.2 A Theoretical Framework to Measure Entrepreneurship

The importance given to entrepreneurship in the policy action agenda has created an increasing demand on statistical information, and as result, the starting of new statistical operations.[5] The first institutions that have tried to create a statistical information system on entrepreneurship face to the difficulty of integrating the different approaches to the entrepreneurship phenomenon. In our attempt to explain the reasons of this situation, maybe the absence of a consolidated research paradigm has caused that action guidelines to capture the statistical information needs have derived from the kind of applied policies. From our perspective, the proliferation of very different origin theories may have impeded the setting of clear guidelines to delimit dimensions and variables to be captured. Because of this, the explanation of a conceptual framework –using models and propositions of the economic analysis on entrepreneurship-, becomes a key element for the development of a statistical system. In this context, the creation of a framework that contributes to delimit factors impacting on the entrepreneurship performance, and on its results and interrelations to other economic variables, represents a optimal strategy to design a statistical system, as well as it may help to solve the diagnosis, design, implementation and validity problems of entrepreneurial promotion policies: a consistent model that may identify all elements useful to increase entrepreneurial network density and quality, and that help us to progress in the international comparability field. Thus, the standardization of concepts, definitions, and forms of measurements must be basic, due to the special characteristics of this research subject.

16.2.1 Systems of Entrepreneurship Indicators Vs. Systems of Competitiveness Indicators

At this moment, we will have a preliminary view of the interest areas for the academy and for policy-makers about the entrepreneurship, areas that may be used as basis to determine if a statistical system satisfies the information needs. However, we do not consider that a statistical information system should be based exclusively on one kind or another type of demand. Therefore, the statistical agencies responsible officers usually declare that the main handicap to articulate a real entrepreneurial statistical system is the difficulty to establish a theoretical framework for the analysis, that help to clarify the dimensions and aspects to capture. Nevertheless, we can state that this approach to entrepreneurship phenomena is not the only possible

[5] Without trying to be really accurate, the most used kind of instruments for entrepreneurial promotion are: i) administrative barriers elimination (procedures simplification); ii) economic contributions; iii) establishment of measures addressed to favour education on entrepreneurship; iv) establishment of tax benefits; v) advising; vi) establishment of measures addressed to favour R+D, and technology transfers; vii) favouring scale increases and firm internationalisation; viii) promotion activities; and, ix) favouring network setting.

approach. Thus, a widespread tradition in some statistical institutions and agencies consists in articling entrepreneurial competitiveness indicators systems. In these systems, competitiveness is considered as central element, and the way to determine dimensions and aspects to be captured by the system is based on theories about the competitiveness determinants. We can often find systems based on the wide know Porter's diamond, which is used to list a series of regular propositions to be taken into account for designing a competitiveness strategy. As an example, this conceptual framework is used by the British Treasure to allow the competitiveness and productivity monitoring in United Kingdom. In this framework, a number of indicators are collected in an attempt of measuring the investment, human capital, firms, and competence: all dimensions considered as key elements that influences on the productivity and competitiveness improvements. Under similar parameters, the Global Competitiveness Report,[6] is based.

On the other hand, a statistical system to measure entrepreneurship sets entrepreneurial market as the centre of the system, while competitiveness, growth, its contribution to employment, or innovation level, must be understood as results, i.e., as consequence of its interrelations to other markets within the general equilibrium model framework. How to use this approach will be the result of a number of different considerations. Firstly, because only by using models, propositions and results, we can identify interesting dimensions that may help to the economic research itself, to the entrepreneurial network diagnosis and monitoring, and if applicable, to public policies design. Secondly, designating a statistical system with these features –highlighting the term "entrepreneurship" or the word "competitiveness"-, would only be a terminology digression without interest, if in both cases, propositions derived from economic analysis over entrepreneurship are to be added. In third place, according to the development stage of this kind of systems, we are in a critical moment in order to favour comparativeness. In this sense, the statistical development of indicators on entrepreneurship is a very essential need, for which several governments and national institutions are trying to satisfy. Nowadays, the OECD leads a project to develop a general statistical framework for entrepreneurship. After a previous conceptual debate about concepts and definitions, it is proposed to create a list with required indicators to understand entrepreneurial network and its effects.[7]

In order to contribute to debate, we can take as reference the theoretical framework used as basis for the Danish Statistical System on entrepreneurship, which attempts to fit to synthesis efforts carried out by Audretsch, Thurik and Verheul (Audretsch et al, 2002), and by Lundström and Stevenson (Lundström and

[6] 188 indicators are taken as starting point, grouped in the following categories: country added indicators; macroeconomic indicators; technology innovation and divulging indicators; information technology and communication indicators; infrastructure indicators; indicators about public institutions, in terms of regulation and corruption measurement; internal competence level indicators; indicators about clusters development; environmental indicators; entrepreneurial operations and strategies indicators, and finally, indicators about international institutions.

[7] See chapters 4,7 and 8.

Stevenson, 2001, 2002, 2005). This model poses the existence of a number of factors that impacts on the entrepreneurs' supply and demand. Demand is determined by profit opportunities, while supply makes reference to the possibility to carry an entrepreneurial project out. Determinants of supply and demand, together with the incentives structure, and a set of cultural and motivation factors, determine the entrepreneurial activity level of a specific sector or region. Although we share the same framework, there are some controversy elements, that, under our point of view, can be: i) there is no accurate distinction between the productive factor and these agents action results; ii) absence of an incentive structure integration, as a factor of supply; iii) consideration of motivation and culture as something external to the personal decision of being entrepreneur; iv) absence of a exhaustive delimitation about which variables or elements must be integrated in the entrepreneurial activity; and specially, v) mixture of some economical analysis elements for entrepreneurship with other kind of approaches, so pseudo-theories and theoretical models quite accurate have been considered as complementary elements.

Taking into account all previous facts, we consider that designing a theoretical framework that combines academic progresses with the practical requirements may result in an "operative" strategy to detect the dimensions and variables to be implemented in a statistical subsystem on entrepreneurship.

16.2.2 The Entrepreneurial Function, the Entrepreneurial Factor and the Productive Agent

From different theories the economical analysis the entrepreneurial factor is based on, we could agree that the entrepreneurial function performance is configured according to, at least, one of the following functions: i) the entrepreneur is an agent that decreases inefficiencies continuously present in firm (Leibenstein 1969, 1979). His actions must be addressed to search for the optimisation of the factor used by selecting the technology combination more adequate for this objective; ii) he find profit opportunities that permanently exist in the markets (Kirzner 1973, 1979, 1985) by using his knowledge about consumers' preferences, about technology combinations, and about factors markets in order to create a productive combination that satisfies this demand; iii) he faces to the uncertainty of predicting the future (Knight 1929); and, iv) he innovates (Schumpeter 1913).

Thus, an agent carries out the entrepreneurial function and, therefore, he constitutes the entrepreneurial factor if he develops any of the vectors that compose the entrepreneurial functions, regardless: i) the success or luck level with which this task is carried out; and, ii) the link with property. This means that, although the same agent could be capitalist and entrepreneur at the same time, or entrepreneur and paid-employee, we should not overlap the productive factors. Just like the same agent can sell his available time as labour factor, and at the same time contribute with his capital, the same agent can combine the entrepreneurial function

performance and the contribution with his capital or labour factor. In this sense, the entrepreneurial function can be carried out by simple paid-employees without any link to capital property –very common case in corporative firms-, just like it can carry out only one of the vectors that configure the entrepreneurial function performance, as this function is done by specialized teams.

With this starting point, for the entrepreneurial factor –just like that for any other productive factor-, a supply and a demand will exist to configure an entrepreneurial factor market, that is to say, available resources and a demand to be satisfied. By clearing this market, expected profits and a specific composition of the network will be generated, that will determine the influence of the market on the entrepreneurial activity results: in terms of competitiveness, the employment creation, the added value generation, and even, the innovation.

The search of both market forces determinants will be our theoretical framework, which must be used to determine the basic dimensions to be included in a statistical information system on entrepreneurship. This system should try to capture all differences in its economic action.

16.3 A Conceptual Framework

According to the premise that any conceptual framework proposal must be based on the most widely accepted propositions, and that it must use the same conceptual schemes that those used on the any other productive factor analysis, the analysis of the entrepreneurial market and its results -if it is either measured in terms of the productive combinations they create or either in terms of its interrelations to other markets-, is a good guide to determine the key dimensions to be captured by a statistical information system on entrepreneurship. Although literature shows an unequal development level associated to the number of contributions from the supply perspective in relation to the analysis of the demand, this fact must not be understood in terms of a complete absence of contributions. Thus, the most frequent way to understand the entrepreneurial factor demand is through this identification with the incentives the economical agents receive if they carry the entrepreneurial action out. This is the idea derived from Schultz (1975) or Casson (1982) theories, who consider that entrepreneur demand is formed by the entrepreneurial profits opportunities. Taking into account this perspective, the entrepreneurial factor demand is conformed by the profit opportunities themselves that each agent is able to detect,[8] so the agent will try to firstly implement the opportunities associated with a higher expected profit rate. This way, the entrepreneurial demand is configured as a decreasing relation between profit opportunities and hours spent on the entrepreneurial function performance.

[8] Nevertheless, the profit opportunities are not detected by everybody the same way, since information and knowledge are not uniformly distributed throughout the population. This fact can help us to understand some aspects of phenomena, such us entrepreneurial concentration or productive specializations in specific areas.

On the other hand, the entrepreneurial factor supply must provide the keys about the economical agent will to offer his effort time to perform the entrepreneurial function. At first sight, any agent has the possibility to be entrepreneur. Each agent will have some kind of capacity derived from his knowledge –innate or acquired-, that will allow him to access to a wider or more limited set of opportunities[9]. The same way, a person can be subjected to some –relative or absolute- restrictions that may impede him to choose that selection, although this may be the chosen option in accordance with the expected performance of this option in relation to the derived performance of the paid-employment. This is a problem related to the occupational choice, although with a subjective assessment element determined by the incertitude associated to the entrepreneurial function performance against the safe wage of the paid-employment especially in labour markets in which normative introduce specific guaranties added to the paid-employment.

Just like in other market, the equilibrium will be carried out when for a certain expected profits level, the required entrepreneurial function performance time to capture an opportunity, matches that time agents are determined to offer to the current profit.

If we think in aggregated terms, as result of this dedication to the entrepreneurial function, an entrepreneurial activity level and productive configurations resulting from is action will be generated, i.e., a specific quantitative and qualitative composition of the entrepreneurial network. This entrepreneurial activity level creates certain production levels, employment, some economic results, and even some specific lines of specialization and innovations, depending on the kind of opportunities that have been detected and captured, and on the productive combinations configured based on its actions. Once this general scheme of analysis has been established, we are ready to analyse the supply and demand determinants that must be included as guidelines to determine the dimensions to be captured in a statistical information system on entrepreneurship.

16.3.1 Entrepreneurship Demand

Let's assume there is a continuous flow of profit opportunities set by the general conditions of the external and internal economic environment, although they are probably limited by both the information the individual has according to his knowledge, and by the existence of some institutions that limit the "potential set" of opportunities to be captured. If we, at this very moment, ignore the restrictions set by institutions, the general conditions of the economic environment, i. e., the economy development –that we can identify it with the driving forces of aggregated supply and demand-, will create an atmosphere for the potential development of businesses, influencing this way on the current feasibility of any profit

[9] Note that in order to access to a higher number of profit opportunities, it is not necessary condition to access to more profitable opportunities.

opportunity. Thus, shocks –being for offer or demand-, regardless the reasons of their origin or the market that created them, will generate variations on the assessment of each entrepreneurial profit opportunity, and they will also imply that some opportunities may be rejected while other can be created. Therefore, dimensions and variables to be kept in a statistical information subsystem match with statistical operations collected in National Accounting, and specifically the match with the most used statistics for the conjuncture analysis, statistical operations quite consolidated that would be directly integrated in an information subsystem on entrepreneurship. On the other hand, together with these general conditions of the environment, a previous condition to capture opportunities has to be with the deregulation and competence level, with the degree of openness, and even with guideless to knowledge diffusion. This way, the existence of absolute barriers for accessing to certain sectors or the restrictive regulations to exercising some kind of activities may imply that some perceptible opportunities are not feasible, becoming in inexistent profit opportunities. We could follow a similar reasoning in relation to the difficulty elements to diffuse technology, and therefore, they impede some productive configurations and some entrepreneurial projects. Thus, very deregulated economies with a high competence level will show profit opportunities, possibly not as high as in other environments, but they will may suitable to be captured by a great part of the entrepreneurial network. On the opposite site, over-regulated economies, with a low competence level will create a set of profit opportunities, possibly with a very high associated performance, but a great part of the entrepreneurial network will have limited access. Let's pose some examples that will help us to clarify the influence of the economy regulation level, and we will try to make a clear distinction from those that could involve administrative obstacles or institutions that have an effect on the productive factor mobilization. These will be analysed later as obstacles that negatively have an effect on the offer.

Let's assume that there is a specific economic activity, which is regulated so that in order to exercise this activity, it is necessary to have a perceptive license, quantity-limited. In this case, in spite of the existence of individuals that would be ready to capture these profit opportunities, there is an absolute barrier to access to this activity. A phenomenon with the same features would derive from the existence of patents (although, this would only imply a temporary absolute barrier), or from the existence of monopolies, regardless their origin.

This way, the demand of entrepreneurs relates the profit opportunities the entrepreneurial network detects and is able to capture. The general conditions of the aggregated supply and demand, the degree of economic freedom, the guideless to diffuse technology, and the degree of openness will determine the set of feasible opportunities, and therefore, these will be the key dimensions to be kept in a proposal of the statistical system on entrepreneurship. Now we proceed with a brief analysis of the mechanism followed by these factors to influence on the demand, as a way of approaching to the variables and indicators that can contribute to capture these dimensions.

The Macroeconomic Environment

In order to proceed with the detection and capturing of the different existence profit opportunities, the entrepreneurial agent must take into account firstly the analysis of the economic environment, where this entrepreneurial activity is carried out. This environment has two sides: the inner side (internal market) and the outer side (external market), with more o less influence depending on the target market and on the origin of the productive factors. The entrepreneur, as any other productive agent, needs information to detect the opportunities and to face incertitude inherent to any entrepreneurial venture. This way, and just like in any investment project assessment, the forecast of demand, factors to be mobilised and costs related to these factors is crucial. Hence, having a good statistical support to be used in making this forecast and to monitor the macroeconomic environment will be basic to the previous assessment before starting the activity. The main information source to monitor and analyse the macroeconomic and sector situation, including forecasts, will be based on having an economic statistical subsystem to be used to collect the required information in order to foresee, in a more secure way, the consequences of the decisions made. Hence, the result of any decision made about the firm's competitive strategy is subjected to the evolution of the general context of businesses: the aggregate demand level, the factor markets and by the Government intervention. Due to this reason, the entrepreneur must interpret the consequences of the conjuncture on the result of his actions. These macroeconomic conditions (internal and external) –according to the required scale to capture the profit opportunity- are summarized in, what we agreed to call, a macroeconomic framework, in which we collect the indicators that measure the aggregated supply and demand determinant factors, originated from quite standardized statistical operations derived from official statistical agencies. However, one of the vectors that define the entrepreneurial function performance derives from the need of facing to the inherent incertitude of this kind of activity. The results of this entrepreneurial activity are, by nature, uncertain and, therefore, the entrepreneurial factor must make decisions in this incertitude framework. Obviously, the quantity information, the interpretation of this information, the forecasts and the methods used to forecast the future will be different depending on the agents. Thus, the suitability level of the strategic decisions of the firm to changes in the economic environment will be linked to the existence, interpretation, and quality of the statistical information, but also to forecasts. Obviously, not all individuals implied on the strategic decision-making make their own interpretations and conjuncture forecast, but they usually base these on the analysis and forecasts made by the public organisms or institutions. This way, the importance of these analysis, from the entrepreneurial factor point of view, is critical, since they set a number of trends on the agents' expectations and, therefore, on the profit opportunities assessment itself. As it is well known, together with the traditional forecasts based on regular analysis, in the conjuncture analysis, forecasts based on opinion surveys have been introduces. These surveys may be related to the entrepreneurial environment or to consumers' trust, and are done to try to measure the agents' expectations through their interpretation of the economic environment changes when attempting to detect changes on consumption or investment trends.

The way these expectations are formed up and the translation to general climates, favourable or unfavourable, is an increasing in importance element for the current economies development. Once at this point, we consider we have provided enough elements to state that the economic conjuncture analysis is a key element to perceive profit opportunities and to estimate their potential. Therefore, this analysis must be included in a statistical information subsystem on entrepreneurship.

The Degree of Economic Freedom

Defence for competence is considered as an essential element to guarantee the economic efficiency, that is why it is included as rule in the most of modern constitutional texts. From our point of view, the existence of barriers that hinder or impede the access to a specific activity sector not only mean an efficiency loss for the economy, but also they cause a decrease in the available profit opportunities for potential entrepreneurs.[10] But, regardless the assessment of its involvements, our interest is focused on articulating indicators to measure this aspect. In this sense, the existence of absolute barriers to the access is usually valued thorough indicators that measure the legal barriers extension or the number of exceptions to the anti-monopoly legislation. A good example of this kind of indicators is that made by the OECD, where the level of number of competitors limited by legislation, is measured.

The Degree of Openness

The degree of openness should impact directly on the profit opportunities. Let's consider a closed economy, where the existent profit opportunities are those derived from the potential demand of the domestic market, while the productive possibilities are limited to the technologic possibilities and to inner productive factors. In an opposite situation, a complete opening of this economy –let's think about a perfect mobility-, will imply the appearance of new profit opportunities. This appearance is due to the extension of latent demands range and of markets dimension, at the same time that this makes production possibilities feasible, which were not possible before due to technology reasons o to the impossibility of mobilizing the required productive factors in the inner market. Hence, the opening increases the entrepreneurial factor demand. Nevertheless, the final result of a greater opening does not imply necessarily an increase in the inner entrepreneurial activity. Although the opening will create new profit opportunities, this will also imply an increase in the entrepreneur's supply, so the impact can even be the opposite.[11]

[10] The point is not choosing having or not a regulation, but being able to assess which elements of the regulation have different effect than those expected.

[11] Given a specific national sector size, the national entrepreneurship crowding-out can be made up by the profits that interaction with foreign firms can provide, in terms of previous experiences, knowledge and technology transfers. From his side, Grossman (1984) shows how the international capital, and specially the direct foreign investments, may imply the expulsion of the national entrepreneurship. In a very similar line, Hausmann y Rodrik (2003) argue that the *laissez-faire*, and specially the opening may create low levels of ex ante investments and self-employment.

Let's ignore, for a moment, these two extreme situations and let's think about an autarchic economy that experiences a progressive opening period. Let's assume, for example, that in this first opening stage, the free movement of capital factor is allowed, but the firm creation from non-national entrepreneurs is forbidden. In this case, the opening would not increase the profit opportunities, but it would favour the entrepreneurs' access to new markets of capital, i. e., it would favour the factor mobilization from the national entrepreneurs' side. This same situation would be also applicable if difficulties exist in order to mobilize labour factor with the desired productivity level and wages, and the arrival of other countries workers is allowed.

Generally speaking, the importance given by governments to the exporting activity of its firms is subjected to its contribution to the economic growth (Lages and Montgomery 2004). These favourable effects have caused that the opening effects analysis has become a subject of increasing interest. The most of these essays argue that countries with a greater number of exporting firms have a global improvement in its competitiveness level, since these firms (either through showing the effect or either by requiring actions to the collaborating national firms) force the remaining activities to make an effort for modernization (Girma et al. 2004). This way, it is widely accepted that an exporting guidance of firms is a favouring factor for the economic growth (Moen 2002), although empirical studies that confirm this are scarce. On the other hand, there are studies that consider exporting firms as more productive firms, with a bigger size and with more probability of survival, while they are capable of paying greater wages than those that do not export (Aw et al. 2000). But, the situation that is not really clear is if the greater productivity showed by these firms is originated in its exporting direction (which allows them to acquire new knowledge, to access to new technologies, and that oblige them to be more competitive), or if the innovation and competitiveness themselves guide these firms towards an exporting activity. To summarize, and despite the relation between the entrepreneurial activity level and the integration level is still a controversial point, the problems in international flows of goods and factors must be subject of tracking and control, and therefore, this relation must be considered in a statistical system that attempts to capture the key dimensions of the entrepreneurship. In this sense, the generally used indicators for the empirical analysis are a good base to act on. This way, the systems should try to capture both integration indicators *de jure*, related to liberalization policies for good and factors movement, as well as indicators *de facto*, related to current flows.

Diffusion of Technology

Innovation, apart from being one of the functions that define the entrepreneurial function performance and one of the entrepreneurial activity output, must be analysed according to the mechanisms used by innovations to propagate throughout the productive system, since these mechanisms are configured as essential elements for its potential conversion to business opportunities. This way, the configuration of the science-technology-industry system is one of the main determinants of

entrepreneurship demand, since this determines the way the innovations are diffuse over the productive system. The traditional elements of the R+D statistics, and its measurement indicators of the inputs and results of the research and development process, have no involvement *per se* in profit opportunities. If the R+D activity, even if it is successful, does not have the appropriate mechanisms to satisfy the productive body demands, or if the connections among systems fail, may become a futile activity with no impact on the economic activity. From the outer perspective, the existence of problems in the technological diffusion processes it the main responsible in the failure to fulfil the convergence proposition related to the neoclassical theory of economic growth. We reference here to the fact that a greater opening –even if this would imply a perfect mobility- does not necessarily imply the access to every profit opportunities of the participating countries in the free trade agreement. This way, some profit opportunities will be protected and hence, these would be limited by patents, regardless if they are process or product-derived. Thus, the economies with a lower technological development level will see that some business opportunities will not be capturable; while in other economies, only through royalties payment that will decrease their expected performance, these opportunities can be captured, but economies will be in a disadvantage situation. The dominant role of the country that has the highest relative development level will become an obstacle to capture these profit opportunities from the national entrepreneurs' side.

16.3.2 The Supply of Entrepreneurship

If demand factors are associated to available opportunities, the supply factors must be associated to the necessary requirements. Thus, the entrepreneurial skills, whether innate or acquired, will have an effect on the perception of opportunities. A second requirement to develop an entrepreneurial project is determined by the ability to mobilize these required productive factors. A potential entrepreneur can detect a profit opportunity, but he will not able to exploit it if he has no rights on factors o he has no way to have them. As it has been stated before, an agent will decide to become entrepreneur if the expected utility is higher than the alternative occupation. In other words, if the expected compensation of the profit opportunity that he attempts to capture is higher than the opportunity cost of the alternative activity, which is the paid-employment once taxes and incentives are discounted, plus a risk bonus and dedication bonus that imply some personal features, such as family situation, that may have some impact on this decision. Hence, all those variables that alter the opportunity cost to perform the entrepreneurial function, as well as those personal features (regardless they derive from personal circumstances or from sociological factors) that may affect the assessment of the incertitude linked to the entrepreneurial chance against the paid-employment, will be determinant aspects of the entrepreneurial offer and, therefore, they will have effects on the quantitative composition of the entrepreneurial network. Finally, the institutions of the labour

and capital markets may affect the relative assessment of the alternative occupations, affecting then on the decision about the occupation.

The Entrepreneurial Human Capital

In principle, it may be expected that having previous experiences in an activity sector increases the knowledge on product and factor markets related to this sector, allows the knowledge of feasible productive combinations and, therefore, it reduces the incertitude associated to any entrepreneurial change as the quantity of available information increases. Likewise, having knowledge and entrepreneurial skills in the management area or in markets will allow the inefficiency decrease, which is other vector that configure the entrepreneurial function performance. This way, it is possible that, generally speaking, individuals with more experience or those who have acquired a higher level of entrepreneurial knowledge (either by formal educational processes or either by non-formal mechanisms, including those considered as externalities) will have a higher probability of detecting profit opportunities. Then, by contributing to the accumulation of this specific kind human capital, the detection of profit opportunities will be favoured and, probably, the improvement of the already established firms' economic results will be favoured too. This way, the literature about entrepreneurial human capital has not only analysed how the different kinds and levels of human capital have an effect on the decision of being entrepreneur, i. e., on the probability of identifying and pursuing business opportunities, but also it has studied its influence on the entrepreneurs performance in terms of survival and work life span, or even on the activity performance itself. Hence, the design of mechanisms that favour the accumulation of this kind of human capital is considered as one of the most efficient instruments to favour the detection of more and better opportunities. That is way the analysis of the design has an important place in the research agenda.

Generally, economies or sectors with a denser entrepreneurial network, with a wider entrepreneurial dimension or a higher technology development, require that the necessary entrepreneurial human capital level to capture profit opportunities must be higher, sometimes becoming a real access barrier to perform the entrepreneurial function. Likewise, the complexity of some entrepreneurial organizations causes that, even in the design stage of a productive combination, needs the creation of a team with a high specialization level on different areas in the entrepreneurial function. Therefore, if we want to capture the entrepreneurial human capital of an individual, economy or sector, we should try to capture somehow, both the stock of entrepreneurial knowledge and its accumulation processes.

In this sense, it is possible that older workers or workers with a wider previous experience may gather entrepreneurial skills, savings and business relations, being more likely to become entrepreneurs, although we agree that proximity between the indicators and the aspects to be measured is not very accurate.

Another possible accumulation mechanism is determined by the intergenerational transfer of entrepreneurial skills. Based on the parents' labour situation, there exists evidence on the following fact. It is more likely that self-employed people's

children become entrepreneurs than paid-employed people's children.[12] This result is supported by the opinion surveys results (Eurobarometer's results) show that self-employed' children are more likely to work as self-employed, than paid-employed people's children.

Apart from these factors, the most intensely studied mechanism of human capital accumulation is that related to the participation on formal educational processes. We do not refer here to the role education may have favouring the existence of a positive social image of the entrepreneurial activity, so education may favour a kind of enterprising spirit,[13], but to the education role in acquiring skills and capabilities that may allow to capture profit opportunities. The economic analysis has intensively studied this relation: Evans and Leighton (1989), Blanchflower and Meyer (1994), and Schuetze (2000) analysis (among others), conclude that there is a positive relation between the educational reached level and the probability of becoming an entrepreneur.

In relation to this question, in a very recent work, Ucbasaran et al. (2006) study in depth this relation, dividing the general human capital effects (education and labour experience) from those of the entrepreneurial human capital (experience as business owner, management skills and technical abilities); effects on the identification and business opportunities, finding evidences to favour both kinds of human capital effects. Parker and Van Praag (2006) try to capture the relative importance of the human capital stock, according the access process to self-employment, i. e., depending on if the access has been by starting a new business or by incorporating into a business already established. This way, it seems that having a higher education level is positively related to the creation of a new business, while by having previous experience in management roles, it is more likely the access to an already established business.[14]

Hence, empirical evidence seems to support the hypothesis, by which the human capital is a determinant factor not only for searching and exploiting business opportunities, but also for the type of access, survival and performance itself. According to these significant effects of the human capital in the entrepreneurial activity results, we consider that a good work guideline to search for indicators that allow us to

[12] See Dunn and Holtz-Eakin (2000), Evans and Leighton (1989), Fairlie and Robb (2005) Chapter 1, Laband and Lentz (1983) or Taylor (1996), among others.

[13] However, European public authorities suggest that education is the mechanism to be used to change attitudes towards risks, so education may contribute to promote the entrepreneurial spirit, fostering a favourable attitude, the sensitising for professional opportunities as entrepreneur, and competencies. From their point of view, starting a business requires energy, creativity and persistence, while its development requires an increasing management ability, which implies efficiency, effectiveness and responsibility. Together with this action line, the European Comission tries to spread the entrepreneurial skills teaching, for example, in technical studies faculties, teaching how an entrepreneurial spirit may contribute to the combination of entrepreneurial and technical potencial. Education on entrepreneurial spirit combined with public programs for research gathers the required elements to join scientific excellence and trading of results.

[14] The literature has also analysed the entrepreneurial human capital performance (Van der Sluis et al. 2006), and Bhattacharjee et al. (2006) about survival probability.

measure the analysed aspects in relation to the entrepreneurial human capital, must distinguish indicators designed to measure the stock of this kind of knowledge from those that capture the voluntary accumulation processes, and from those indicators that capture unintentionally acquired knowledge.

Regarding the first mechanism, the stock originated through participation in formal mechanisms, we will find the same difficulties that those traditionally encountered to measure human capital. Then, the most intuitive and common way to tackle the human capital stock measurement at an aggregated level, generally uses the study levels reached by population. An easy way to extrapolate this kind of measurement to the self-employment level, is by crossing the educational level and type of occupation variables, so we can be able to measure the educational level of self-employed individuals against the educational level of paid-employed individuals. Limitations to this procedure are well known: i) this is an imperfect proxy of the real level of knowledge, since acquired knowledge by individuals of the same educational level and type may be different, not only among individuals, but also in regions; ii) not all the same kind of education has the same impact on the productive activities.[15]

These problems leads us to the operations implementation to measure the entrepreneurial aptitudes, as well as to the exploitation of different studies influence, previously defining which studies are related (according to their contents) to having entrepreneurial skills. To control the knowledge stock acquired through other mechanisms, the information gathering about the relatives' labour situation in surveys about labour forces or home panels, together with a possible implementation of new statistical operations, is the master line to be followed by the indicators search, which will allow to increase the measurement accuracy of this aspect.

Productive Factors Mobilization

A second requirement for the development of an entrepreneurial project is being able to mobilize the required productive factors. This way, the access to the propriety rights of the capital factor, or having enough labour factor with the required human capital, are essential requirement to start a business. But, we have to make reference also to the existence of non-excludable factors, i.e., considered as public goods, such as transport or communications infrastructure, which will decrease the necessary factors resources and will favour the factors mobilization in a specific location.

[15] We would agree that not all kinds of education, regardless the attainted level, have the same impact on the abilities to capture and to undertake an entrepreneurial project. This way, a priori this is less prone to doubt that with this kind of measurement, two societies formed by the same number of agents, and with the same educational level would show the same measurement of entrepreneurial human capital stock, regardless whether they have a History or Industrial Engineering five years degree.

A) The Supply of Capital

Although it is easy to confuse the agent with the productive factor, specially when the capital factor and entrepreneurial factor are provided by the same agent, in order to become an entrepreneur, not only the existence of liquidity constraints is a key variable, but also the difficulty to access to any kind of financing. Due to this, a great part of the empirical essay is focused on analysing the role of these liquidity constraints when deciding to be entrepreneur. Thus, and generally speaking, literature seems to show a solid confirmation of the hypothesis that states the following. It seems that certain kind of entrepreneurial projects, specially those that need big quantities of capital to be developed, depend not really much on the own previous funds, but rather on how accessible the capital markets are, on the accessibility to search for investors, and the development level of the financing institutions.

This way, the quantity of available funds, the number of financed operations, the development level of the different financing institutions and any other indicator that allows us to capture the relative importance of each financing source, are one of the aspect that must be give more focus on, from the design of new statistical operations point of view.

B) The Labour Market

A regulated market, with problems that impede the adjustment, or with an unsuitable inadequate human capital, may hinder the starting of any entrepreneurial project.[16] But, the labour market also plays a role, from a different perspective: the paid-employment is the alternative activity in the occupational choice problem. Therefore, the labour market features, either related to the relative remuneration of each occupation, either how this affects to the incertitude level, will be elements that favour or hinder the decision of being entrepreneur.

This way, a highly regulated market, in which the elements of permanent hiring or temporary hiring and high wages will create an increase in the self-employment opportunity cost, both in terms of the rejected wage, as well as to the incertitude level related to each occupation.

Finally, the labour market features have consequences on the localization. The existence of a labour factor with a suitable human capital for the project requirements (professional human capital), and with efficiency and cost levels that make this feasible become essential not only for the project feasibility itself, but this is also basic for the localization of the entrepreneurial activity. Thus, the impossibility to hire labour factor with suitable features for the business nature, with the productivity level according to the business' requirements o with higher wages, may cause that a project may not be feasible in a specific productive localization.

[16] Let's consider the effect that some institutions of the labour market, such as the existence of termination costs or permanent hiring formulas may have some effects on the labour factor demand.

Due to the previous facts, we can deduct that usable indicators to approach the mobilisation potential of this factor may contribute to capture, at least, the wage costs, the productivity levels, the human capital and costs related to institutions.

C) Infrastructure

A suitable support for this entrepreneurial activity requires a professional highly qualified consultancy service that may be capable to provide the required information and knowledge (the know-how). Together with this network, the availability of some public goods, such as communication and transport infrastructures or the existence of localizations with specific infrastructures or service firms (industry, technology parks or industry areas) or even networks, decrease the installation costs, create synergies with effects on the efficiency, and favour the innovation. Therefore, these are favouring elements for localization in the places where they appear, and for starting new entrepreneurial projects (Pittaway et al. 2004). Thus, the existence of firms with complementary activities, the existence of firms incubators, the industry parks or the industry networks, and the cooperation centres are some of the elements that form this infrastructure for entrepreneurship, regardless their public or private nature. Finally, cooperation among the institutions of R+D and firms will cause that decisions may be made based on the knowledge sources, which will surely imply a higher effectiveness and suitability level. The structural statistics, related to the communication infrastructures and R+D, have indicators likely to be used to measure this aspect.

Personal Features

Although personal features are not explicitly included in models, the empirical literature confirms that some behaviour patterns may influence on the choice of occupation. This decision depends on the personal features of the entrepreneurial network components, and they are related also to the family core as the decision-maker. Taking the gender into account, women participation rate in self-employment is substantially lower than men's rate. But, this phenomenon is not limited to self-employment. However, the importance of this phenomenon is given by the existence of a bigger difference in relation to paid-employment. The different roles played by women and men in the family core o the higher dedication related to entrepreneurial chances have been some of the hypothesis analysed by literature to explain the phenomenon. If the whole family as a unit makes the decision of the occupation, the family features must have a critical importance when choosing the occupation, due to the implications of this decision on the dedication regime to other activities, and even on the family inheritance itself (Borjas 1986). Likewise, a finding (probably related to the cultural background of specific groups) is given by the high participation of certain groups and ethnic groups in the entrepreneurial network. Thus, it seems that immigrants from certain geographic areas o people from specific ethnic minorities usually chose self-employment against paid-employment.

Costs and Incentives: Taxes and Social Security

A common way of favouring transfers to self-employment is by proving specific incentives (taxes or bonuses in social security fees), so these incentives may decrease the opportunity cost of the alternative occupation. The underlying reason for this kind of measurements is that taxation obligations and costs related to the fulfilment of these obligations must not be an obstacle to create firms nor for their development or consolidation. So, by making the tax obligations lighter and simplifying procedures and requirements associated to its fulfilment, these may be elements that contribute to the firm development, growth and survival. In 1994, Domar and Musgrave suggested using the taxation system as a way to compensate the risk costs related to self-employment through the deduction of the generated losses. The introduction of differences in the taxation treatment of self-employed and paid-employed, in the most of the taxation systems, has moved the interest on the analysis of effects of the taxation on the choice of occupation to the opposite side, i. e., on the analysis of the distortions that these differences may generate over the choice of occupation, given the possibilities of tax evasion related to self-employment. The essays of Watson (1985), Kesselman (1989), Pestieau and Possen (1991), or Jung et al. (1994), Schuetze (2000) or Parker (2004), are only some of the examples of this work guidelines. Using microdata, the empirical essays have identified the different effects of tax regulations on the self-employment.[17] This way, Carrol et al. (2000a, 2000b, 2001) conclude that taxation over personal incomes of self-employed people changes significantly their employment, investment, and expansion decisions. On their side, Blau (1987), Bruce (2000) and Schuetze (2000) find that a high taxation pressure decrease access to self-employment. Parker and Robson (2004) show that self-employment ratio is positive and significantly related to tax rates of the incomes tax. As marginal income tax rates increase, the entrepreneurs tend to expand their businesses slower, and to invest less and to hire less people.[18]

On the other hand, taxes structure also affects to entrepreneurial incentives, and specially, to aspects, such as the linear or progressive nature of taxes, the repayment allowed or the applicable taxation benefits. Generally, both the level and the structure of taxes determine the activity and decisions of the firms, and specifically, those related to the organizational structure, to the combination of productive factors, to financing sources, and to distribution of profits and composition of assets.

But, as well as the taxation charge itself, we should not ignore either the importance of the costs related to taxation fulfilment on the firms' side. This called "indirect taxation pressure" include charges derived from taxation information collection, from demand of lots of taxation charges and deduction at source of different taxes, taxation accounting, consultancy services on the subject, audits and from legal procedures.

[17] Bruce (2000) states that an increase of 5 percentual points in the difference between the expected marginal income tax rate of paid-employed and self-employed, reduces the transition from paid-employment to self-employment in 2.4 percentual points.

[18] Holtz-Eakin & Rosen (2001)

Together with tax incentives, some deductions to social costs play the same role when favouring this occupation choice. Steinberger (2005) considers the existence of a negative relation between the size of the Social Security system and the entrepreneurial activity within a specific country. Parker and Robson (2004), on their side, show how self-employment rates are negatively related to social security contribution from employers' side.

Sociological and Psychological Factors

The basic model of choice of occupation shows that a person will chose self-employment if its associated utility surpasses that of the paid-employment. As we have stated before, literature usually makes operative the concept of associated utility of each occupation through its identification with the incomes. However, as stated before, a set of subjective perceptions, such as the desire of personal development or desire of being one's own boss, are psychological factors directly related to the associated utility of each occupation. These psychological factors have been subjected to accurate studies, where emphasis is on intentions, rather than on observed behaviours. This way, we are trying to detect, through the opinion surveys results, the scene of the individuals' preferences. The aim is analysing motivations, different to earnings, that are taking into account when deciding to be entrepreneur. The most surprising result of this kind of studies is the fact that *a priori* the number of individuals that would wish to be entrepreneur almost trebles the proportion of existent self-employed people. This fact has been considered by politicians that it is necessary to clear obstacles that impede this scene of preferences is not showed in occupation decisions. Desire of being one's own boss (the independency), controlling or even choosing this occupation as a mechanism of social promotion, are motivations showed by individuals in relation to the choice of occupation.

From a similar point of view, although focused on the risk perception, the role assigned in different cultures to excessive incomes, the social regard for entrepreneurs, or even the study of higher frequency of entrepreneurial activities in some ethnic groups, are analysed with interest and some measurements are even created to mitigate adverse possible effects of these sociological elements. This way, the promotion of successful entrepreneurs' experiences, or the introduction of elements that diminish the risk perception in certain cultures, are created as essential elements to remove negative possible effects on the decision to be entrepreneur. Although these factors are formed by assumptions, perceptions and elements associated to learning, the key question is creating mechanisms used for these factors to favour the entrepreneurs appearing. Obviously, imposing a new culture that favours these values is not feasible, but it is possible to apply some measurements so social consideration of the entrepreneurial role may change gradually. The entrepreneurial labour promotion of the people who have developed successfully entrepreneurial projects or favouring the leadership culture in formal education through role play, are some of the most commonly used measurements. The Global Entrepreneurship Monitoring is, until this very moment, the only useful source, at European level, to collect indicators that allow us to capture these aspects.

16.3.3 The Entrepreneurial Activity

Following the proposed conceptual scheme, and once the entrepreneurial factor determinants of offer and demand are analysed in a specific sector or area, we will devote this section to the search of dimensions and indicators to capture the supply and demand junction results, which will allow us to: i) quantify the network, either from the perspective of the agents, or either from the productive configurations perspective derived from agent's actions, by using the stock variables; ii) analyse the network dynamics, through the entry and exit analysis or through success using flow variables; iii) diagnose and monitor the entrepreneurial network output, in terms of economic results or according to its interrelations to other markets.

In other terms, if in the two previous sections, we have tried to capture the control factors, which knowledge is essential to the possible therapies application, in this section, we will analyse the result variables, which are the key for the diagnosis and tracking of the entrepreneurial network. To undertake this task, we will firstly introduce a debate about the measurement of the entrepreneurial network from the productive factor perspective, i. e., trying to quantify the number of agents who carry any of the vectors that configure the performance of the entrepreneurial function in a specific sector or area. The measurement of the agents who perform the entrepreneurial function, either as self-employed or performing the management functions in a corporative firm, will lead us to the discussion about the use of Surveys about the labour forces as main source, to the harmonization of the self-employment (business ownership) concept, and lastly, to the analysis of other measurement essays through specific surveys, such as Global Entrepreneurship Monitoring (GEM).

The second approach to the quantitative composition of the entrepreneurial network, in relation to the stock quantification, is carried out from a lightly different perspective, in which the attention is paid on the productive unit (firm or establishment), and not on the agent or agents, who undertake this task. In other terms, attention is moved from the entrepreneurial factor analysis to the productive organizations analysis (derived from the entrepreneurial factor), to the firm analysis. We refer here to the firms and establishments' records exploitation, to the so-called business structural surveys. Without considering which of these perspectives is the most accurate (for being futile), we think that the most positive approach to the phenomenon must be the exploitation of the information from both statistical sources, and try to take advantage of their complementary elements. This must allow us to have a more complete analysis on the entrepreneurship phenomenon, wishing that statistical operations of agencies and institutions move forward the conciliation of both sources.

After the availability, features, potentials and weaknesses of the available sources and indicators to stock approaches, we devote to the analysis of the network dynamics, in terms of flow variables. Afterwards, we focus our attention on the growth and survival capacity, that is, on identifying the key variables, which allow us to clarify the evolution of factors that favour or hinder the entrepreneurial success and its growth. Finally, and as we have stated before, the last approach to the entrepreneurial network is performed in terms of the economic results of the

entrepreneurial activity, adding the impacts this activity has on the innovation, employment, and competitiveness of the economy.

The Stock

If we want to approach to the knowing of the quantitative composition of the entrepreneurial network in a specific sector or area, we would need to decide previously if we want to quantify the productive factor or the resulting organizations of its activity. Insisting on the difference is not a trivial question, and this even poses some problems for territory divisions. Let's pose some extreme examples to clarify the previous statement. Let's think on the existence of a territory with a very high entrepreneurial density, in terms of a high number of firms and work centres, but nevertheless, this territory has very low self-employment rates vs. a territory or sector with lots of agents developing the entrepreneurial activity, but where there are a few establishments, as its production centres, or even its organizations, are based in other territories. We will agree that diagnosis of both situations is very different, and that involvements of these entrepreneurial activities will be also different, in terms of impacts on the growth, competitiveness, and employment in that specific territory or sector. Then, we think that combining these two perspectives for the analysis of the quantitative composition of the entrepreneurial network is essential, in order to find accurate diagnosis and tracking of the entrepreneurial network in an economy or sector.

This way, in order to approach to the quantitative composition from the perspective of the productive factor, we will agree that the entrepreneurial network in a specific area (sector or space), is composed of the group of agents who undertake at least one of the functions that define the entrepreneurial action performance. This way, the entrepreneurial network (strictly considered), will be composed of the agents who perform the entrepreneurial function, either in individual firms or corporations, while if we use a wide perspective of the network, this would also include agencies for entrepreneurial promotion, or consultancy agencies, among others. On the other hand, and from the productive organizations point of view –firms, establishments or productive centres-, we can distinguish firms, and firms' local units, it is to say, the sections of each firms located in different places on the firm's account. Hence, we discuss now about the alternative sources and indicators to measure the firms and entrepreneurs stock.

The measurement of the number of self-employed people as proxy of the people who perform the entrepreneurial function in a specific territory is, and has been, the mostly used solution to quantify the number of agents who compound the entrepreneurial network, since this proxy easily derives from the Surveys on Labour Forces, by analysing employed people per professional situation, which allows to distinguish self-employed people (employers with employees and own-account workers), and paid-employed workers.[19] This way, the number of self-employed

[19] In this sense, the international guidelines are more in favour of not considering the relatives' help as real entrepreneurs. Because of this, the term "self-employment" makes reference to the

people or the self-employment rate has been a variable chosen for this measurement of the entrepreneurial activity to be operative. This method of measurement has been used to favour the comparative analysis, since (despite the differences) it may be in the labour statistics area where this has progressed the most from the international harmonization of concepts and definitions point of view. Thus, in the European context, the unification of the Surveys on the Labour Forces allows international comparisons about self-employment in the different European territories. The concept of business owner (self-employed) –people who have a firm, constituted or not, and who are not simple investors on the firm, but they work for that firm and receive a wage), used by van Stel, is an example of the harmonization of data derived from the OECD's statistics on labour forces.[20]

It is also remarkable the effort made by the GEM.[21] This project is a research program, began on 1998, conceived to generate annual harmonised data on entrepreneurship, and which main aim is to measure the entrepreneurial activities in their first stages, for each country in order to favour comparison cross-country.[22]

Focusing on the potential indicators derived from the exploitations of Surveys on Labour Forces, these will allow us (through classifications of employed people per professional situation and per occupation) to quantify the number of people who exert the entrepreneurial activity, either by one's own account o by being employed, and to successfully to approach to the quantitative composition of the individual and corporative entrepreneurial activity, strictly considered.[23] Together with these surveys on labour forces, the population surveys, which include in their questionnaires questions about the professional situation (Surveys on Households or Surveys on Family Budgets, among others) become alternative sources to measure self-employment in a specific sector or area. To finish the measurement of the

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sum of employers with and without paid-employed people. However, this omission probably leads us to underestimate the real role of entrepreneur women, taking into account that some of these women will be classified within the relatives' help, but they should be considered as partners at the same level than that of the business owner (Felstead and Leighton 1992; Marshall 1999).

[20] See van Stel (2005).

[21] For more informatin about the GEM project at international level, please see Web site http://www.gemconsortium.org; see Web site http://www.ie.edu/gem for GEM project in Spain. Information on GEM project in Andalusia may be found in http://www.gem-andalucia.org. For a more accurate description on the research, please see Reynolds *et al*. (2005).

[22] To undertake this task, the Total early-stage Entrepreneurial Activity or TEA-index is created. This index derives from the identification of emerging entrepreneurs (people being 18 to 64 years old who were devoted to starting up activities of new businesses in the previous year of this interview, and who have not paid more than three wages in that very moment), and owners-managers of emerging businesses (less than 42 months). Despite the method differences, having information previous to the starting-up favours the motivations analysis.

[23] This survey allows us to have the classification of employed people per professional situation. According to this criterion, the Spanish LFS divides employed people in this classification: employers, entrepreneurs without employed people or freelance workers, cooperative members, relatives' contribution, paid-employed people, and others. The number of employers and entrepreneurs without employed people is configured with right proxies to quantify the individual entrepreneurial factor, in strict sense.

entrepreneurial factor stock, we have to capture someway those individuals who perform the entrepreneurial function in corporations, it is to say, those cases in which the division between propriety and control implies that it is not the same agent who provide the entrepreneurial factor and the capital.[24] In this kind of firms, the entrepreneurial activity is carried out by manager, sometimes not linked at all to the ownership of the firm. Because of this, if we want to measure the entrepreneurial network, we need indicators which allow us to capture the quantitative importance of this corporative entrepreneurial network.

Once again, the source for this kind of indicators is the Survey on Labour Force (related to employed individuals) together with other population surveys, where social-labour data are collected. The procedure, although imperfect, seems to use the classification of workers per occupation[25]. This way, in the Spanish LFS, when classifying workers per occupation, we have a category in which management members and people of the public administration and directors and managers of firms are included. Moreover, there is a variable in blank for individuals who work in the private sector, and it provides information about the kind of public administration where the individual works, including a category of public firms and public financing institutions. This let us to consider if we may consider the hypothesis about no public paid-employed individual exerts the entrepreneurial function.

Once the measurement of the productive factor if analysed, we will pay attention now to the productive unit: firm or establishment. We refer here to the firms and establishments' records exploitation, to the generally so-called structural surveys of firms. The importance of its analysis lays on that this is a key variable when knowing the features of productive configurations derived from the entrepreneurial factor. The most part of statistical agencies use, as main source to generate structural statistics of firms, the information provided in the firms' and establishments' records, so comparison methods for this data are subjected to the chosen statistical unit, the chosen source, its coverage, the chosen threshold to include or exclude a firm or establishment, or the chosen time to identify entries and exists[26].

[24] As we have stated before, if we consider that the delimitation criterion of an entrepreneur is defined by the performance of any of the vectors which define the entrepreneurial function, we will agree that when approaching the number of entrepreneurs through self-employment, we would leaving aside those individuals who perform the entrepreneurial role as paid-employed people.

[25] According to the International Standard Classification of Occupations (ISCO-1988), the major group number 1, includes legislators, senior officials and managers. Managers are specifically divided in two groups: corporative (managers and executive chiefs, production and operation departments managers and managers from other departments), and general managers. The difference between both groups is derived from the existence of entrepreneurial management teams formed by three or more members (the corporative group), while general managers include individuals that perform the entrepreneurial role alone or with the owner help, without having any other help or another manager assistance. For more information about this subject, please visit http://laborsta.ilo.org/applv8/data/isco88e.htlm.

[26] See Vale (2006).

The Flow

Now we will focus on how we can analyse the dynamics of the network, according to the distinction done between the entrepreneurial factor and the productive configurations derived from its action, once the entrepreneurial quantification is analysed based on the stock variables. From the point of view of factors, and through the proposed indicators to measure stock, we can create flow indicators using the vegetative growth calculation and the analysis of the professional situation changes during the permanence of the individual on the sample From the point of view of the firms, the structural statistics of firms provide information about the entry and exit flows.

Success: Growth and Survival

From the analysis of the determinant factors of the entrepreneurial success, expressed in terms of survival and growth, we can find some guidelines to create indicators which allow us to forecast the entrepreneurial network development, either by analysing the survival of the agent, as well as of firms and establishments already built. Detecting success factors for self-employment is not an easy task by using variables and indicators gathered through population surveys. The human capital level, having previous experiences in self-employment, and knowing the activity sector are some of the proxies we are limited to use in the empirical analysis. Because of this, it is required to implement some kind of specific statistical operation to detect the success factors among entrepreneurs, who form the panel during the first years of a firm.

The Output

Finally, and in order to conclude our analysis on the entrepreneurial activity, let's analyse its output, in terms of economy, employment, competitiveness and innovations results. A logical way to act, if we want to measure *ex post* the entrepreneurial activity results, is consulting the analysis on the economic information included in balances. As corporative firms are obliged to show the annual balances in commerce registries, making different statistical operations to exploit these results have been favoured. Thus, in Spain, the Central Registry of Balances of the Spanish Central Bank makes the exploitation of this information, which may be used to know the economic result of the Spanish firms. In this kind of statistical operation, we have to move forward on comparison methods, quite complex issue given the existent differences in the accounting normative.

A second aspect the system should try to capture is collecting the information about the effects of the entrepreneurial market on the labour market. Nowadays, using the available statistical information in population surveys, we can only analyse aggregate elements to confirm whether self-employment and paid-employment cycles move or not following a defined schema. It is possible to make more accurate analysis by using the structural surveys of firms, since these surveys gather information about the variables of employment, linking these variables to establishment.

The third aspect in quantifying the output is delimited by the attempt to measure the entrepreneurial network contribution to the technological innovation processes and by how this network assumes technological innovations. Surveys on innovation of firms are a good reference, since they provide with indicators about the most important variables of these processes, either through the measurement of the input or output of these processes.

To complete our analysis, we should focus now on competitiveness. As we have stated before, capturing certain profit opportunities and their economic results will depend on the junction of factors of offer and demand. Then, the competitiveness of the resulting firms is only one of the consequences of the entrepreneurial network quality and composition. This way, competitiveness is only the result, in comparative terms, of a set of factors that cause the entrepreneurial factor in a specific area performs its function with more or less relative success level. In other words, competitiveness is only a relative concept that makes reference to the capability of doing things better than others, regardless it is done at individual, firm or territory level. Generally, the measurement of competitiveness usually includes the measurement of the costs of factors, of imposition, productivity, labour force creation, or R+D processes. All these dimensions, within our system framework, are determinant factors of the entrepreneurship, already collected in our system.

Due to the previous facts, the measurement of the competitiveness should imply the search for results rates of an economy with regard to its close environment, either through the rate of relative prices (fixed by exchange rates), as well as through any kind of synthetic rate of entrepreneurship, which allows to analyse, in comparison terms, the factors that affect the entrepreneurial factor market.

16.4 Conclusions and Future Agenda

Although there is some kind of general agreement about the importance of the entrepreneurial factor because of its contribution to the processes for generation of employment, innovation, and to the economy growth, and therefore, about the convenience of its promotion, knowing the mechanisms used for the entrepreneurial factor to operate in any of these processes, this agreement is quite weak. In spite of this, governments are focused on designing and implementing entrepreneurial promotion strategies, mainly aimed to “improve” the business environment in an attempt to increase the self-employment rate and, in some cases, the existent entrepreneurial network quality, so this network may be increasingly dynamic in relation to its contribution to the previously mentioned processes. Nevertheless, we will agree there are very few countries and regions that have statistical subsystems with a development level similar to those subsystems designed to analyse the economic juncture, the labour market, or the markets. Generally, analysts, policy makers and statistical information users must resign with more or less accurate approaches (except in very rare occasions) to variables and aspects tried to be measured, based on the exploitation of surveys and records, thought and designed

for other aims. This paper has introduced a reference framework to build an entrepreneurship system, detailing the theoretical mechanisms recommended for each dimension studied in the theoretical model, and collecting indicators about any of the considered aspects. The following Table (16.1) summarises the dimensions to be captured by our proposed statistical system on entrepreneurship, and the number of indicators potentially to be used for each considered aspect.

Based on the analysis and exclusively being focused on the objective assessments of the statistical operations usually implemented, the implementation of such a kind of system will require the study of the implementation of statistical operations that allow to provide with indicators to aspects that are not currently covered enough. Specifically: i) move forward through the design of sample exploitations from Social Security, which allow the simultaneous analysis of the productive factors and the productive units, being a good starting point the operations designed by the Statistical Management of Firms of the OECD for this aim; ii) study more deeply the financing statistical field, in relation to the consecution of a system of indicators on financing volumes and sources for new firms and to the development level of financing entities aimed to supply with capital to entrepreneurs and firms; iii) implement operations that allow to capture the entrepreneurial taxation in an harmonised framework with other regions, and in the national and supranational context; iv) study more deeply the sociological and psychological factors, either by directly participating in existent essays (GEM) as well as applying Eurostat Eurobarometer methods; v) study the design of success factor surveys based on the

Table 16.1 Aspects and dimensions

Demand					
Profit opportunities					
Environment Legislation Degree of Openness Technological Diffusion					
Supply					
Human Capital	*Factor Mobilization*	*Characteristics*	*Costs and Incentives*	*Non-economic factors*	*Institutions*
Stock Investment)	Capital Labor Infrastructure	Individual Family	Taxes Social Security	Sociological Psychological	Labor Market Financial Market Administrative Burdens
Economic Activity					
Stock	*Flow*	*Sucess*			*Output*
Entrepreneurs Firms	Entrepreneurs Firms	Entrepreneurs Firms Innovation Competitiveness			Employment Results

sampling and tracking of a entrepreneurs and firms panel, from its birth to its first years; vi) move forward on the indicators related to the institutional, and vii) design a synthetic indicator of entrepreneurship (competitiveness), that may be compared to those created by other international institutions.

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