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Mercedes Teruel Carrizosa
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CHAPTER 1

INTRODUCTION

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CHAPTER 1

INTRODUCTION

> "*We know a great deal about the direction of movement of one variable with the movement of another, a little about the magnitudes of such movements, and almost nothing about the functional forms of the underlying relations*".
>
> Ijiri and Simon (1977)

1.1. PRESENTATION

Economic dynamics is largely determined by the performance of firms. Standards of living, macroeconomic variables and unemployment, to mention just a few examples, are highly correlated with the economic performance of firms. To explain the performance of the economy in general, we have to analyse the behaviour of active and potential microeconomic agents.

The main aim of this thesis is to analyse the growth of Spanish firms in the manufacturing and service industries between 1994 and 2002. The Spanish case is interesting because of the scarcity of the literature in this field, which is mainly due to the lack of databases. See, however, the recent work of Fariñas and Moreno (2000), Correa et al. (2003), Peña (2004) and Calvo (2006). However, these studies only partially analyse

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economic activity since they do not distinguish between industries, focus only on the firm growth process or concentrate on one Spanish region.

In this thesis, our interest in differentiating between manufacturing and service industries stems from the fact that today we are part of a globalised economy in which consumers spend more on the service and leisure sectors and in which more firms need the services of other firms. Nevertheless, services are still ignored by researchers (Audretsch et al., 2004).

To analyse firm growth we adopt Gibrat's Law. Gibrat (1931) postulates that the growth of a firm does not depend on its initial size. The main consequence of this hypothesis is the right-skewed distribution of firms in the market. In fact, Ijiri and Simon (1977) determine that "*there are two reasons why this [Gibrat's Law] is a plausible assumption on economic grounds. First, it agrees with the empirical findings. Secondly, if, as we have postulated, there exists approximately constant returns to scale (above a critical minimum size of firm) it is natural to expect the firms in each size-class to have the same chance on the average of increasing or decreasing in size in proportion to their present size*".

Recent empirical evidence, however, rejects this Law and supports the idea that small firms have a greater potential to grow. Obviously, there are different ways to measure both a firm's capacity to grow and the limits of its growth. However, Gibrat's Law has been one of the major focuses for Firm Demography and several authors, including Jovanovic (1982), Ericson and Pakes (1995) and Pakes and Ericson (1998), have incorporated Gibrat's Law into their models.

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As Ijiri and Simon (1977) pointed out, "*stochastic explanations for the size distribution of firms have considerable interest for economic theory and policy*". They interpret these distributions in terms of the dynamics of the growth process rather than in terms of static cost curves. Several reasons support the importance of analysing firm growth.

First, from the point of view of industrial policy, by analysing firm growth we can determine the external and internal characteristics that determine the evolution of firms. One of the main concerns of policy makers is economic growth. To enhance territorial evolution, firms receive subsidies to create positive externalities in the local economy. However, subsidies must be efficient, which means that, in order to make efficient investments, policy makers should know which characteristics positively affect firm growth (Santarelli and Vivarelli, 2002).

Second, research into firm growth will have a positive effect on an important Spanish issue: employment. After a long period of high unemployment, unemployment is still one of the population's main concerns. Firm growth is therefore crucial to determining which firms are more likely to increase in size and create stable jobs (Wagner, 1992).

Third, firm growth may be crucial to firm survival. It is a stylised fact that firms are created undersized (Geroski, 1995), i.e. they are created with fewer employees than the minimum efficient scale. Firm survival is one condition for increasing firm size but, also, a firm needs to grow in order to survive. If a firm is to survive it must therefore increase its size constantly over time (Segarra and Callejón, 2002). Obviously, firm growth should be solid over a medium period of time in order to increase the firm's likelihood of survival.

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Fourth, firm growth is a way to introduce innovations and increase competitiveness in the market. When a firm increases in size, its production increases. To sell all of its production in the market, they need to be competitive. One way to be competitive is to innovate. This increase in market competitiveness should enhance the allocative efficiency of resources among firms, increase the variety of products available and steer prices towards marginal cost.

Finally, firm growth will influence the evolution of market concentration i.e. if small firms grow more quickly than large firms, market concentration will tend to diminish. On the other hand, if large firms grow more quickly than small firms, market concentration will tend to increase. The analysis of firm growth is therefore crucial to determining the evolution of market concentration.

Firm growth is therefore an interesting field to analyse since such an analysis will benefit economic growth, employment and the future survival of firms.

1.2. MOTIVATIONS AND CONTRIBUTIONS

In this section I will explain what motivated me to write this PhD thesis, describe how the thesis is organised and advance some of its main contributions.

My membership of the GRIT (Group of Research of Industry and Territory) research group has been crucial to my research development. This group has mainly focused on industry and territorial dynamics from several approaches. GRIT is one of the first Spanish research groups to

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analyse Firm Demography, which is widely studied in international economics but ignored until last decade in Spain largely because of lack of data (Segarra et al., 2002).

Within the field of Firm Demography, there are several research areas, such as firm entry, exit and growth. Entries and exits have been widely studied but firm growth has been less so. A plausible reason for this is the complexity of the process, which is driven by multiple forces.

I gained a strong interest in firm growth during my doctoral dissertation at the University Rovira i Virgili when I analysed the empirical and theoretical literature, again during my MSc dissertation at the University of Essex when I analysed Spanish firm growth, and finally during this PhD thesis.

The chapters of this thesis are organised as follows. In Chapter 2 I review the theoretical and empirical literature. I first present several ways to analyse the firm growth process and describe the theoretical approaches in the economic literature. I then focus on the stochastic firm growth approach, emphasizing its main hypothesis and presenting the wide range of empirical evidence.

In Chapter 3 I analyse Gibrat's Law and the different determinants related to Jovanovic's (1982) model. The main aim is not only to determine whether Gibrat's Law is accomplished between manufacturing and service industries, but also to determine both the relationship between firm growth and age and the differences between industries. I therefore investigated the presence of Jovanovic's (1982) passive learning models and Ericson and Pakes's (1995) active learning models.

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Gibrat's Law estimates firm growth depending on previous size. However, one branch of the literature analyses the possible correlation between past and future firm growth process. This possible relationship between temporal growth rates is known as the persistence of firm growth. Gibrat's Law is called the static method for analysing firm growth (Piergiovanni, 2002; Audretsch et al., 2004), while the analysis of persistence is known as the dynamic method.

In Chapter 4 I analyse the persistence of firm growth. First I present the theoretical and empirical evidence. Then I estimate dependence for Spanish firms and discuss the relationship between the persistence and the learning process. We are also interested in the previous path evolution. This means that the effect of past evolution on the future may depend on previous firm trajectory. In other words, a firm that has grown in the previous two periods will have a different pattern from a firm that has decreased in size in the same period.

In chapter 5 I stress the fact that initial characteristics are crucial for future firm growth equilibrium. I characterise the final equilibrium of firm growth according to several crucial variables, including external activity, the characteristics of the firm and location pattern. I also stress the influence of the firm size of aggregate industries, manufactures and service industries, on the firm growth.

In chapter 6 I analyse the determinants of firm growth in manufacturing and service industries. I pay special attention to regional and sectorial factors related to external economies and barriers to grow. Then I classify firms depending on the technological and innovative intensity of sectors where they operate and I estimate the relationship between firm growth and determinants.

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In Chapter 7 I summarise the main conclusions and implications for industrial policy. Finally, I include several statistical and methodological annexes enlarging or clarifying the information from the previous chapters.

This thesis reviews several outstanding, mainly empirical, contributions that are closely related to the analysis of firm growth. Firm growth has been widely studied by authors such as Audretsch (1995a), Lotti et al. (2001) and Mata and Portugal (2004) and can be viewed from several perspectives. Most of the literature has focused on manufacturing industries, while service industries have remained in the shadow. Audretsch et al. (2004), Piergiovanni et al. (2002), Santarelli (1997) and Oliveira and Fortunato (2004a, 2004b) are some of the few contributions that have analysed the service industries. In Spain, however, there have been very few studies in this field. In the last ten years, Correa (1999), Fariñas and Moreno (2000), Correa et al. (2003), Peña (2004) and Calvo (2006) are the most important of these. The aim of this thesis is to further our knowledge of Spanish firm growth from several perspectives: an analysis of Gibrat's Law (or the Law of Proportionate Effects), the persistence of firm growth and the different equilibria between manufacturing and service industries.

The analysis of Gibrat's Law relates firm growth to firm size. Gibrat's Law suggests that firm growth is random, which means that large and small firms are just as likely to grow.

Gibrat's Law adopts a static perspective. Firm growth is related to a static variable: firm size in a particular period of time. We can take a step further and achieve a dynamic perspective. By analysing the

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persistence of firm growth, we can relate the current performance of a firm with its past evolution. The consequence is that firms with past positive firm growth may have more probabilities to grow than those with past negative firm growth. However, we can also analyse the different long run firm growth equilibria between manufacturing and service industries. The interaction of external and internal variables may be behind the diverse patterns of firm growth.

To analyse all these aspects we have used the SABI database (Sistema de Análisis de Balances Ibéricos), which provides individual data at the firm level from Spain and Portugal. The years available are from 1992 to 2004 but, since there are many lags, we have shortened the information for the last two years. The SABI database compiles data from balance sheets, financial rates, administrative information, etc. about 95% of the active firms in an industry.

1.3. MAIN CONCLUSIONS

In general, our results agree with previous ones. Gibrat's Law is not accepted and, like in most of the recent literature, we found that small firms tend to grow more quickly than large firms. Moreover, age seems to be a key variable in determining differences in firm growth, although its effects are considerably inferior to the size impact.

The main consequence of this is that market structure does not tend to concentrate. Although small and large firms coexist simultaneously in the market, large firms do not increase in size more intensively than small firms.

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With regard to firm growth persistence, our results show that there is a positive relationship between past growth and future growth. However, this time dependence diminishes over time, which means that firms that grew in the past will grow more in the future.

Finally, our data show that the differences between manufacturing and service industries are significant, especially when we include territorial variables. Territorial variables make the differences between manufacturing and service industries significant when both groups are analysed separately.

More specifically for each chapter, our main results are:

- In Chapter 2 I highlight the various theoretical approaches for analysing firm growth. The existence of different theories is due to the the complexity of this phenomenon. Despite this variety, Gibrat's Law is one of the hypotheses that have most been used to analyse firm performance. Although there is much empirical evidence, there are still some gaps in the literature. First, the literature has mainly analysed manufacturing industries while service industries have been largely ignored. Second, few studies have incorporated locational variables although in other research fields of the Firm Demography the locational variables have been widely studied.
- In Chapter 3 I analyse firm growth, Jovanovic's (1982) passive learning model and Ericson and Pakes's (1995) active learning model. Specifically, our results reject Gibrat's Law in favour of small firms i.e. small firms grow more quickly than large firms. Experience in the market seems to be a significant factor behind firm growth, though its impact is relatively small.

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- In Chapter 4 I present the determinants of the persistence of firm growth and differences that are conditional on past behaviour. Our results show a positive relationship between past growth and current growth i.e. firms that grew in the past will also grow in the future. However, there seem to be significant differences between individual sectors. Analysis of the persistence of firm growth conditioned to past performance shows a positive relationship between a firm's growth and its future evolution. In other words, firms that grew in the past will also grow in the future. Therefore, policy-makers should take into account the evolution of firms when applying supporting policies to favour firm growth.
- In Chapter 5, comparison of firm growth in the manufacturing and service industries shows that these types of industry behave heterogeneously. Obviously, growth in different industries is not homogeneous. However, when locational variables are introduced, the differences between the two types of industries are not significantly different. The only exception is the analysis of individual series. Our main conclusion is that manufacturing industries should be analysed separately from service industries when the spatial dimension is introduced. Main conclusion is that initial condition matter for future firm growth.
- In Chapter 6, regional and sectorial variables are crucial factors to firm growth. Our main conclusion is that regional and sectorial factors affect heterogeneously between manufacturing and service industries. Moreover, MAR and Jacobs externalities affect differently depending on the technological and knowledge intensity of sectors where firms operate. In particular, technologically non-intensive manufactures located in a diversified environment will grow more than technologically non-intensive manufactures located in other areas. In reference to the Jacobs

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externalities – i.e. the specialised externalities–, specialised environments present positive externalities for manufacturing firms but they present negative externalities on service firms regardless of the technological intensity. Therefore, regional and sectorial variables affect firm growth evolution.

The different patterns of firm growth can have important consequences for the labour market, the social market, subsidy policies and tax policies, etc. Although many contributions have sought answers to some of the previous questions, there are still gaps in the empirical literature. Today we are part of a globalised economy in which technologies and services are crucial to economic growth. Moreover, few studies have focused on the service sectors, but differentiating between manufacturing and service industries is important. We have found that the locational pattern is crucial to analysing the manufacturing and service industries separately.

Our study has scope for several future lines of research. One line of research would be to investigate which territorial factors drive the patterns of firms located in different spatial regions. There have been few studies of firm growth in relation to territorial variables. Clearly, the environment in which a firm develops its activity is crucial to its post-entry performance.

Service industries are significantly different from manufacturing industries because of the differences in the minimum efficient scale needed to remain active in the market. A second line of research would therefore involve the industrial forces that drive the different patterns between industries.

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