

CHAPTER 7

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CHAPTER 7

CONCLUSIONS

“The essence of knowledge is having it, to apply it; not having it, to admit your ignorance”.

Confucius

7.1. INTRODUCTION

The aim of this study was to examine the extent to which firm size influenced firm growth and the behaviour of Spanish manufacturing and service industries between 1994 and 2002 from the perspective of stochastic growth theory. This study has responded to the need to consider firm size as a key variable for future firm growth and examined the impact of different industries on the development of firms, the learning process, and the impact of internal and external firm characteristics.

Firm growth is the process that affects firms while they remain active in the market. Some theories define firm growth as an adjustment of size due to the internal or external environment. Others define it as a response to luck factors. However, there remain some questions related to firm growth without answer.

We have based our analysis of firm growth on Gibrat's Law, or the Law of Proportionate Effects. Gibrat's Law suggests that all firms have the same probability to grow regardless of their size. However, there are both mixed results and several gaps in the literature.

The research questions that have guided this dissertation are as follows:

- What is the relationship between firm growth and size? Is experience in the market a relevant variable? Are there any differences between manufacturing and service industries?
- Do firms show persistence of growth that could lead to different path dependence while firms are active in the market? Does history play a role in the growth pattern of firms?
- To what extent are the behaviours and responses of firms promoted by interaction with individual characteristics and locational features? Are there any differences in the firm growth equilibrium between industries?
- Which factors affect firm growth? Do technological and knowledge intensive sectors affect firm growth?

In this final chapter, we will briefly summarize the results of the previous chapters. In the third section we highlight the main contributions from these chapters and discuss their implications. Importantly, we believe that the main contributions are empirical rather than theoretical and that the many questions raised in this Thesis help to improve knowledge of the Spanish case. Finally, we embrace a slightly broader perspective and highlight things we did not try (but might have done if it were not for time constraints). We also propose lines of research that we believe are of very great interest but that we did not incorporate in our research because the methodology was not easily accessible or simply because we did not have a clear idea about how to approach it.

7.2. SUMMARY AND CONCLUSIONS

This section presents the main objectives and empirical results obtained in each of the previous chapters. We also highlight the relationship between the different chapters and introduce the various studies.

In general, we believe that our results adequately fulfil the aim of our study, which was to investigate the firm growth process in the manufacturing and service industries. Basically the tasks we undertook in this Thesis were: (i) to test Gibrat's Law, (ii) to analyse the persistence of firm growth, and (iii) to examine the different equilibria.

7.2.1. The theoretical literature

Industrial organization has evolved over the last few decades. One of the main focuses of industrial organization is firm growth, which has become a focus of attention for empirical and theoretical researchers. The variety of theoretical approaches in the literature, however, illustrates the complexity of this process.

The aim of the second chapter was to review the literature. First, we gave an overview of the various theoretical approaches to firm growth, as well as their characteristics and consequences. We also presented the empirical and theoretical literature on Gibrat's Law. Finally, we reviewed the scarce Spanish empirical literature on stochastic growth models.

With regard to the results of the second chapter, our analysis of the theoretical literature showed how difficult it is to determine the factors that justify the skewed distribution of firms in the market. Also, each

model differed in its implications for the distribution of firms. Consequently, researchers tend to adopt one approach or another and justify their preference.

The results of our empirical review of Gibrat's Law are:

- Firm growth is a complex process that is affected by internal and external characteristics that may be due to deterministic or random factors. This mixture highlights the importance of including essential variables in the analysis of firm growth.
- There is consensus in the literature about the adjustment of Gibrat's Law to the unequal distribution of firms in the market. Although other approaches seem to be in agreement regarding firm behaviour, their macroeconomic results do not match the empirical evidence of the market.
- The methods and results in the literature show that the speed of growth of firms depends on the, for example, the country, the databases used and the period of time. A comparison of the various studies in the literature is therefore needed in order to agree on a better explanation.
- Comparison of national and international studies reveals several important gaps in the empirical studies. Firstly, few empirical studies have analysed the service industries (Audretsch et al., 2004). Secondly, few researchers have incorporated the spatial dimension into their analysis.

The Spanish evidence is scarce and we should out the recent contribution of Calvo (2006), Peña (2004), Correa et al. (2003) and Fariñas and Moreno (2000). Past contributions are characterised either by a scarcity of firms in their samples or by the absence of service industries in their analysis.

7.2.2. Gibrat's Law

Based on Gibrat's Law, Chapter 3 aimed to determine whether the stochastic growth model is satisfied. We also analysed the Learning process behind firm growth behaviour for Spanish firms between 1994 and 2002. Although initial contributions accepted Gibrat's Law, later studies found evidence to reject it. In agreement with this recent literature, our results also rejected Gibrat's Law.

Using panel data procedures, the results of this chapter showed that there is no explosion of the market since small firms tend to grow more than large firms. Consequently, there is a negative relationship between firm size and its later growth rate. The policy implication of this result is that small firms in manufacturing and service industries will have more impact on the creation of employment than large firms. Therefore, small firms in our sample appear to have been crucial for employment and economic growth in the Spanish economy between 1994 and 2002.

Several conclusions can be drawn from the work so far. Gibrat's Law is rejected for both manufacturing and service industries. More interestingly, these results do not change when the firm's learning process in the market is introduced. More specifically, firm age has a positive effect on firm size regardless of the type of industry, though this effect is not excessively high.

Growth behaviour appears to depend on the type of industry. The firm growth pattern is known to depend on the characteristics of the industry. Therefore, if we consider different sectors, the firm growth pattern is heterogeneous. Das (1995) pointed out that this heterogeneity may be due to the different industries analysed, since each industry has different technologies and perhaps different growth processes (Das, 1995).

The literature analysing Gibrat's Law is ample but it leaves several gaps and unanswered questions. One of these is the whether there are any differences between manufacturing and service industries. Many studies have reported heterogeneity between these types of industry but this has not been tested in the empirical literature. This chapter has helped to fill this gap.

7.2.3. The persistence of firm growth

The persistence of firm growth offers a dynamic approach to the growth pattern. The relationship between past and current growth rates are also related to Gibrat's Law. The persistence of firm growth is important for policy makers and managers, who need to consider the pattern behind firm growth in order to increase the profitability of their investments, job creation and economic growth.

In this chapter we applied the GMM estimation developed by Arellano and Bond. Our results found a positive relationship between past and current firm growth. Therefore, firms growing in the past have above average growth rates and firms with negative growth rates are punished in the future.

As expected, the effect of persistence depends on the proximity of the growth. In other words, positive growth will have a greater impact on the next period than on the next but one period. This means that the positive effects on firm growth rates dissolve with time.

Individual sectors in the manufacturing and service industries do not present different patterns. However, trends in the persistence of growth

appear to be heterogeneous between different industries. This heterogeneity should be taken into account in future work.

The contributions of this chapter to the empirical literature are: (i) it differentiated between manufacturing and service sectors and used a large sample of Spanish firms, (ii) it analysed persistence by introducing the firms' past history, and (iii) it is the most recent study of persistence of Spanish growth, a field which should not be ignored by social agents.

7.2.4. The equilibrium of firm growth between industries

Chapter 5 evaluated the presence of different equilibria between manufacturing and service industries. To prove these differences, we introduced internal and external firm characteristics. Our results rejected Gibrat's Law. Specifically, there is a negative relationship between firm growth and firm size i.e. smaller firms have a higher growth rate. There will therefore be a trend for firms to converge in the industry.

Our results show that some firm characteristics, such as belonging to a group of firms, being a Joint Stock Company or having external activity, have a positive impact on firm growth.

When testing the presence of different equilibria in firm growth, our results show that there is a significant difference in growth between manufacturing and service sector firms that persists when other firm-specific characteristics were controlled for.

Firm location is a key variable for explaining the different growth equilibria between the two types of industry. While the presence of different equilibria is always accepted when internal characteristics are

introduced, introducing location variables causes these different trends to be non-significant. To determine how important it is to differentiate between manufacturing and service industries, we estimated Gibrat's Law for these industries in separate equations. Our results showed that the equilibria are different when the locational variables are included.

7.2.5. Determinants of firm growth

In Chapter 6 we analysed the extent of other factors affecting firm growth, including the locational pattern. As well as individual and regional variables, we also included cyclical and sectorial variables in order to incorporate the effects of economic evolution and the sector in which the firm operates. We also enriched the regional variables by introducing variables to explain locational externalities.

As expected, variables such as territorial R&D and growth of GDP presented positive externalities for firm growth. Moreover, introducing variables to measure industrial diversity or specialisation led to a diversity of results that depended on the territory. For example, there were differences between technologically intensive and technologically non-intensive sectors. Specifically, technologically non-intensive manufacturers located in a diversified environment grow more than technologically non-intensive manufacturers in other areas. Also, specialised environments present positive externalities for manufacturing firms but negative externalities for service firms regardless of the technological intensity.

Barriers to entry, such as capital intensity and minimum efficient size, act as barriers to growth. This means that sectors that are highly capital intensive will prevent firms from growing. Conversely, sectors with low barriers to entry have low barriers to growth. However, these barriers to

growth can be overcome by internal characteristics such as innovation, cooperation, an increase in human capital, etc.

In conclusion, firm growth depends on both external and internal variables. I am aware that firm pattern depends on a wide range of variables, but here we have stressed the role of certain crucial ones.

7.3. FURTHER WORK

Time constraints limit the depth of any analysis. In our case further work still needs to be done:

a) To test the proposed framework in several territories and sectors. It would be interesting to widen the selection of industries, analyse various subsectors more thoroughly and compare different countries in order to homogenise the empirical evidence.

b) To extend the model associated with stochastic growth, include growth patterns such as the firm growth dependence proposed by classical economists, and compare the results with those of random growth models.

c) To expand the sample to include long-term panel data and take advantage of the long-term properties of temporal series. Also,

- To include mechanisms to allow concepts to be handled based on user and individual preferences of all the developed proposals. It would therefore be interesting to evaluate the firm growth process using simulation techniques as well as neural networks, intelligent agents.

Conclusions

- To continue the work done in order to determine which elements may determine the firm growth process and assess their impact on market structure.

The analysis of firm growth is a first step in an interesting field of research that deserves further investigation. The crucial implications for policy, market structure and the economic evolution of regions are sufficient reasons why this process should be taken into account in Firm Demography.