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GROWTH DETERMINANTS: EMPIRICAL EVIDENCE FROM SURVIVING AND NON-SURVIVING SMEs IN PORTUGAL

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Dedication

"Being a teacher is not just a matter of having a body of knowledge and ability to control the class. This could be done with a computer and a bat. To be a teacher one must also have the ability to establish human relationships with people to whom he teaches. Learning is a human social and arduous process, the same can be said of teaching. Teaching entails both emotions and pure reason. " (Connell, 1997)

In fact, words are not enough to express our gratitude. However, Prof. Paulo Maçãs, was from the beginning, the example always wanted to follow. And it was in that master could see that he is an exceptional person because even with his problems, always managed to follow me and be always there to help me. So I'd like to dedicate this whole dissertation to it as a sign of my gratitude to him.

Thanks

“Gratitude is a nice feeling. Grows where seeds are released, flourishes under the sun. A warm and good heart, longer rises cuidada.Quase all have reasons for gratitude in our lives when people have time to share and make us know by good deeds that we are in their thoughts and that they care.” (Connell, 1997)

This space is dedicated to those who, in some way, contributed to this dissertation was performed. Not be feasible to name them all, however there are some whom. I must express my appreciation and sincere thanks.

My advisor, Professor Paulo Maçãs, always be able to count on her contagious enthusiasm, your joy and your kind word of acknowledgment and encouragement every time. The support, manifested availability and the trust contributed decisively to this work has come to fruition. I also thank the constant support and incentives throughout the Masters.

And my parents and my sister, for always encouraging me to meet the challenges, to do more and better. A very special word of gratitude to them for their unconditional love and how over all these years, as well, were able to help me.

Abstract

Based on two samples: 1) 1830 surviving SMEs; and 2) 406 non-surviving SMEs, this paper contributes to the literature on SME growth, checking the differences between the growth determinants of surviving SMEs and non-surviving SMEs. The multiple empirical evidence obtained allows us to conclude that there are significant differences in the relationships between determinants and growth in surviving and non-surviving SMEs: 1) Gibrat`s Law is rejected in the context of surviving SMEs, but it is not in that of non-surviving SMEs; 2) in surviving SMEs, age is a restrictive determinant of growth, with R&D expenditure, debt, government subsidies and labour productivity being determinants stimulating growth, whereas in non-surviving SMEs, R&D expenditure and debt are restrictive determinants of growth, but age, government subsidies and labour productivity are neither positive nor restrictive determinants of growth; and 3) cash flow is a positive determinant of growth in both surviving and non-surviving SMEs, but it is of greater importance for the growth of non-surviving SMEs than for that of surviving SMEs. The empirical evidence obtained allows us to make suggestions to SME owners/managers and political decision-makers.

Keywords

Gibrat´s Law, Growth, Non-Surviving SMEs; Panel Data, Surviving SMEs.

Jel Classifications

C23, G32, L21

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List of Acronyms

SME	Small Medium Entreprise
R & D	Research and Development
EU	European Union
SABI	Anaysis Sistem of Iberian Balance Sheets
OLS	Ordinary Least Squares

Chapter 1

Introduction

The choice by SMEs can be interpreted as relevant, however, these companies represent a large part of the business fabric of many countries, one of these examples, and it is Portugal. What meets the article Fernandes & Serrasqueiro & Marques (2011), who point out that the SMEs constitute the majority of companies in the business fabric of Portugal, France, Spain, Greece and others, representing the largest proportion of offer employment. One can also say that the SMEs, according to the European Commission, are companies that have to meet at least two of the three conditions that are in force, as follows, employing less than 250 workers, or have a volume of businesses that do not exceed the level of EUR 40 million, or have a lower balance sheet total to 27 million. For a better understanding of the types of SME, then a framework that explains the differences between the three types of existing SME is, according to the European Commission.

Table 1. Distinguish the type of SMEs

Category	*Effectives*	*Turnover*	*Balance sheet total*
Average company	*<250*	*≤ 50 Million of euros*	*≤ 43 Million of euros*
Small company	*<50*	*≤ 10 Million of euros*	*≤ 10 Million of euros*
Micro company	*<10*	*≤ 2 Million of euros*	*≤ 2 Million of euros*

For large companies, according to the European Commission, it can be assumed that it is the company that has over 250 employees and has one or turnover exceeding EUR 50 million or a balance sheet total more than EUR 43 million. According to the European Commission, the SMEs are considered the "gigants of the European economy", accounting for 99.8% of all enterprises, of which 93% are micro enterprises, creating 80.8 million jobs.

Analysis regarding the companies in this study, it is necessary to have two important concepts, survivors and non-survivors companies. In the case of the surviving companies, as the name implies, are companies that are operating in the market. While no surviving companies are companies which somehow does not act in the market, but have worked.

Gibrat (1931) concludes that firm growth is not dependent on size, this conclusion is known in the literature as the Gibrat´s law. From the theoretical point of view, Gibrat`s Law indicates

that some firms manage to reach an appropriate growth rate, assuring their survival, while other firms do not reach that growth rate and do not survive, thus firm size not being related to the growth rate. After the conclusions of Gibrat (1931), countless empirical studies have tested Gibrat's Law. Results have been mixed, depending on firm size, sector of activity and other firm´s characteristics (Audretsch et all, 2004).

When the subject of analysis is SMEs, various authors (Yasuda, 2005; Honjo & Harada, 2006; Oliveira & Fortunato, 2006; Lotti et all, 2009; Bentzen et all, 2012; Lopez Gracia & Puente, 2012; and Maçãs Nunes et all, 2013) have tested Gibrat´s Law, concluding that small firms grow faster than larger ones, thereby rejecting Gibrat´s Law, given that firm's rate of growth depends on firm´s size. This result may be explained by the fact of small firms try to increase their growth rate to reach, as fast as possible, a minimum scale of efficiency that allows them to survive in their operating markets.

In the SME context, besides testing Gibrat´s Law, some authors have considered other determinants of SME growth. For example, Honjo & Harada (2006) and Oliveira and Fortunato (2006) consider the implications of financial variables, and Yasuda (2005) considers the influence of innovation, on SME growth. In general, the authors' conclusions indicate that firms' financial variables and innovation influence SME growth.

Given the importance of SMEs in European Union (EU) countries, political decision-makers have instigated various policies seeking to promote entrepreneurship (for example: the framework for competitiveness and innovation; programmes to support the entrepreneurial spirit; programmes promoting the firm´s creation, management and growth) and by doing so, contribute to increased employment and economic growth (Giovannetti et all, 2011; Adame Sánchez & Miquel Romero, 2012; Renko et all, 2012). In this context, it is worth to analyze the impact of governmental support on the growth of surviving SMEs, seeking to understand the importance of that support for the growth of those SMEs.

In Portugal, SMEs represent around 99.6% of all firms, therefore SMEs are particularly relevant for increased employment and economic growth (Instituto de Apoio às Pequenas e Médias Empresas e à Inovação,2008). Considering this situation, it is important to understand the differences between the growth determinants of surviving and non-surviving SMEs, so as to adopt economic policies that can contribute to the growth of SMEs. In general, SMEs have good investment projects, but face particular difficulties in managing their resources, which threats their possibility to reach a minimum scale of efficiency, which allows their survival in operating markets.

The literature on SME growth has not addressed the study of the differences in the growth determinants of surviving and non-surviving SMEs. Given the importance of this topic for EU countries in general, and Portugal in particular, this paper intends to fill this gap by studying

the differences in the growth determinants of surviving and non-surviving SMEs in Portugal. Al in all, Gibrat's law has been a great reference in research on the determinants of business growth since its formulation in 1931 (Sutton, 1997). This law states essentially that business growth is independent of firm size. However, the empirical literature most authors reject the relationship between firm size and growth. However, most empirical studies on the determinants of growth of companies have found that there is an inverse relationship between firm age and growth. In addition, the empirical literature can also be seen that various features are now mentioned, in addition to size and age, which may also affect the growth. With them, the legal form of business, ownership structure and location, among others. Thus, there is one of our goals is, are the determinants of growth of SMEs survivors of different determinants of growth of SMEs not surviving to achieve this objective, the current study tests the Gibrat's Law in the context of surviving and non-surviving SMEs considering, besides size, other possible determinants: 1) age of firm; 2) R&D; 3) cash flow; 4) debt; 5) government subsidies; and 6) labour productivity.

To reach the goal of this study, methodologically, we consider two samples of Portuguese SMEs: 1) 1830 surviving SMEs; and 2) 406 non-surviving SMEs. As estimation method, we use Ordinary Least Squares (OLS) regressions, estimating the standard deviations of parameters according to the possible existence of heteroscedasticity. We use the Chow test to test the differences between the growth determinants of surviving and non-surviving SMEs.

This paper makes an important contribution to the literature on SMEs' growth determinants, since it is pioneering in studying specifically the differences between the determinants of surviving SMEs and non-surviving SMEs. More precisely, this study concludes that the growth determinants of surviving SMEs are considerably different from those of non-surviving SMEs.

After this introduction, the paper is structured as follows: 1) section 2 presents the literature review concerning the review of literature of the growth determinants, 2) section 3 present methodology used in the paper, namely the database, variables and estimation method; 3) section 4 presents the results; 4) section 5 present the discussion of the results, and 5) section 6 presents the conclusions and implications of the paper.

Chapter 2

Literature review and research hypotheses

2.1. Size

Gibrat (1931) concluded that large and small companies have the same odds of finding a certain growth rate. To Gibrat (1931), some companies can achieve a certain growth rate and are able to survive in their markets, while others do not reach an appropriate growth rate and can not survive. Therefore, according to Gibrat's Law, small businesses do not need to grow as fast as large companies.

However, Sutton (1997) concluded that business growth is dependent on its size. As a general rule, this author argues that small businesses have higher growth rates than large, this is because small businesses feel the need to grow, thus enabling greater efficiency on the part of these companies efficiency, allowing their survival in the markets. The conclusions of Sutton (1997) are reinforced by Audrestsch et all (2004), where the authors conclude that small businesses are more likely to grow in comparison to large enterprises, since, in general, operate at a small scale sub-optimal size.

According to the conclusions of Sutton (1997) and Audretsch et all (2004), can be expected that small businesses are able to grow and that its growth rate decreases as you increase its size, going against the Law Gibrat's. In the initial phase of the company, we can expect that SMEs have a higher growth rate than SMEs, in later stages, since the first years of SME activity is the main strategic concern reach a sufficient minimum size to allow their survival.

Thus, we can expect that there is a negative relationship between growth in the present period with the size in the previous period. In later stages of the life cycle of SMEs, we can expect that the relationship between growth in the current period and its size in the previous period may be less relevant. Lotti et all (2009) found that empirically, the age of Italian SMEs increases, compared to growth in the current period and the size in the previous period, thus becoming less important. Fotopoulos & Giotopoulos (2010) found that Gibrat's Law is not true for the Greek young SMEs however becomes true for the former Greek SME.

In the empirical evidence related to SMEs, particularly in Portugal (Oliveira & Fortunato, 2006), Sweden (Heshmati, 2001), Italy (Becchetti and Trovato, 2002; Lotti et all, 2003), Spain (Calvo, 2006; Moreno & Casillas, 2007) and Japan (Yasuda, 2005; Honjo & Harada, 2006) in most of these studies, the results confirm that law Gibrat had a negative relationship, and statistically significant relationships were detected between growth and size.

Be expected that surviving SMEs find a minimum efficient scale to survive in their markets, growing less as they approach this scale, ie, growth is increasingly smaller as the size increases. Already non-surviving SMEs have not found a rate of growth that enable them to grow to reach a minimum efficient scale, so it is expected that its growth is not related to their size.

According to Barkham et all (1996), small businesses and large enterprises have different motivations for growth, such as (i) small businesses grow because of the need to reach a minimum efficient scale that allows the survival; and (ii) large companies can grow with the possible strategic changes as a result of changes taking place in the markets. The conclusions of Barkham et all (1996) are enhanced by Audretsch et all (2004), where the authors point to the motivation and growth of small businesses, which have to do with the need to find a minimum efficient scale that allows survival. Thus, economies of scale are the main reason behind the growth of companies that are smaller than they would be if they have reached the minimum efficient scale.

Based on the arguments presented, we formulated the following research hypothesis:

H1: For SMEs survivors Gibrat`s Law is rejected it as not succeeding for non-surviving SMEs.

2.2. Age

Jovanovic (1982) concluded that the companies at the beginning of its life cycle, had as its main objective, the growth in order to achieve a minimum efficient scale that allows them to survive in their markets. This implies that companies in the early years of the life cycle, grow faster, although the growth rate decreases with increasing the years of the companies. These conclusions were reinforced by Fariñas & Moreno (1997), in which the authors concluded that younger companies have higher growth rates than the older ones.

Several studies have undertaken the task of evaluating the relationship between the growth of the company and its size. Under the law of Gibrat, the fundamental assumption is that the growth of a company at any given time, is independent of the size of the company at the beginning of the period.

Kumar (1985) and Chen et all (1985) in a study of agribusiness companies found no relationship between the size and growth. More recently, Acs and Audretsch (1990) also found, in a study on the industrial sector of the US for the period 1976 to 1980, concluded that Gibrat's law was valid. The same happened to Wagner (1992) in an empirical study of the

growth of companies in the agribusiness sector. All results of these studies suggest that Gibrat law is valid, that is, the growth rate is independent of its size.

In the case of Lumpkin (1998), Shane & Venkataraman (2000), concluded that those companies, generally more proactive and better informed about the level of risk associated with investment opportunities, have better efficacy rate in concerns the use of profitable businesses, compared to older companies. Thus, according to Lumpkin (1998) and Shane & Venkataraman (2000), there is a negative correlation between age and growth, giving greater capacity to grow by the young companies.

Lotti et all (2003), in the case of Italian SMEs, reveals that the age of the businesses are a key feature to investigate the validity of Gibrat's Law. The authors conclude that in the beginning of the life cycle of a business, the Act Gibrat can not be considered valid since they are detected negative relationship between growth and size, as well as between age and growth. However, in later stages of the life cycle of surviving firms, the authors tend to consider Gibrat's law as valid, since the growth of Italian SMEs is seen as independent of the size and age.

However, the results of Heshmati (2001) for Sweden, deserve special attention, as the author concludes that the nature of the relationship between growth and age depends on the estimation method used, it is not possible to say definitively that there is a negative relationship between growth and age.

In addition, Jovanovic (1982) concludes that companies in the early years of their life cycle are mainly concern achieve a minimum efficient scale, which allows them to survive. The smaller size of SMEs compared to large enterprises, the greater the relative importance of the need for achieving a minimum scale which enables them to survive, since they are particularly at risk and the effects of competition.

It is expected that young surviving SMEs grow faster than old surviving SMEs, since its main objective in the early years of life is to find a minimum efficient scale that enable them to survive. Therefore, it is natural that the pace of growth is diminishing with increasing age of the SMEs. Younger non-surviving SMEs may not have found a growth rate sufficient to survive in the markets where they operated, so for these SMEs growth may not be related to age. The vast majority of empirical evidence in the context of SMEs, points to a negative and statistically significant relationship between growth and age, for example, in the case of Portugal (Oliveira & Fortunato, 2006), Italy (Becchetti & Trovato, 2002), Spain (Calvo, 2006; Moreno & Casillas, 2007) and Japan (Yasuda, 2005; Honjo & Harada, 2006). It can be seen that they support the hypothesis that growth is not related to age.

Based on the arguments presented, we formulated the following research hypothesis:

H2: For the surviving SMEs the relationship between age and growth is negative this is not happening for non-surviving SMEs.

2.3. Research and Development

The influence of R & D intensity on the growth of SMEs is a matter of great interest and complexity, especially with regard to the need for structural transformation of the economies of developed countries. The expense R & D may serve as a barrier to new companies entering the market, since, in many instances, is significant sunk costs (Montgomery, 1994; Sutton, 1998). Barriers to entry supported by competition in markets characterized by high R & D, can lead to high rates of growth in existing businesses, since less competition, can allow them to have greater investment opportunities and, consequently, greater opportunities for growth.

Many authors, including, Deloof (2003), Rogers (2004), Baptista & Karaoz (2011), found that the intensity in R & D has a positive effect on the growth of SMEs. As for expenditure on R & D, this contributes to the increasing diversification of activities, making SMEs more competitive. This expense also allows for increased export capacity, which can contribute decisively to reduce the level of risk associated with activities of SMEs (Beise Zee & Rammer, 2006).

The greater strategic and organizational flexibility of SMEs, together with the possibility of diversification of activities as a result of R & D investment can encourage SMEs to form strategic cooperation networks with other companies (Rogers, 2004; Rickne, 2006). Networks can help you implement strategies that include complementary activities with other companies or with other knowledge centers (e.g., higher education institutions and research laboratories), thus increasing the marginal value of the strategy of each individual company (Arora & Gambardella, 1990).

Investment in R & D increases the company's ability to absorb information, ie, the ability to absorb knowledge created from the relationships formed with agents external to the company, thus enabling the use of this to increase the company's performance (Cohen & Levinthal, 1990; Gilsing et all, 2008; De Jong & Freel, 2010).

However, the intensity in R & D can also reduce the growth of SMEs, for investment in R & D is associated with a high level of risk, coupled with the creation of intangible assets of the company, which, in turn, can make the level of risk faced by SMEs is even greater. This can add difficulties for SMEs in obtaining external financing, hampering efforts to grow and / or

diversify (Yasuda, 2005; Müller and Zimmermann, 2009). The efficient use of investment in R & D requires knowledge management and sporadic investment, however, a little sophisticated management, may even contribute to the decline in growth (Santarelli & Sterlacchini, 1990; Müller & Zimmermann, 2009). Management projects that involve high intensity of R & D can be problematic in the short term, which can lead to the intensity in R & D, thus becoming a restrictive factor for growth, rather than stimulating (Müller & Zimmermann, 2009).

Del Monte & Papagni (2003) and Lee (2009) conclude that the effect of R & D intensity on the growth of various companies according to the sector, that is, on the one hand, companies with low technological intensity can find the innovations resulting from R & D investment, which are easily copied by competitors and are not a barrier to the entry of new market entrants. On the other hand, in sectors with high technological intensity, characterized by high investments in R & D and significant economies of scale in R & D investment can act as an effective barrier to new companies entering the market. Therefore, the R & D investment can positively influence the growth of firms in high-tech sectors, but the same positive effect is not found in companies of high-tech sectors.

Compared with large enterprises, SMEs face additional difficulties in managing R & D projects, which require skilled human resources and efficient management of technology and information (Freel, 2003; Lee, 2009). This can further restrict the efficient implementation of R & D projects Therefore, it is especially important to note that most scientific positions in SMEs are found in high-tech sectors (Kuusisto, 2008).

Other factors have been advanced in the literature that may be important to boost the performance of companies: (i) good internal organization; (Eisingerich et all, 2009) (ii) appropriate strategies for diversification activities (Kindström & Kowalkowski 2009; Noone et all, 2009); and (iii) the strategic cooperation between the companies with respect to R & D projects (Lee, 2009). Greater organizational flexibility of SMEs (Rogers, 2004; Rickne, 2006), combined with its higher absorption capacity (Cohen & Levinthal, 1990; Gilsing et all, 2008; De Jong & Freel, 2010) and with a greater ability to implement complementary strategies with other companies or R & D institutions (Arora & Gambardella, 1990) can explain why these companies have greater internal organizational capacity. Since, in the case of companies with high technology, they have a greater capacity for internal organization, greater strategic flexibility and establish strategic cooperation networks with shared resources. So together, these factors may contribute to higher growth rates in these companies.

Hölzl (2009) concludes that the effects of learning and experience in conducting business processes of R & D project management are key determinants for success. The author found most relevant intensity of R & D, in determining the performance of companies in the North and Central European countries, than in Southern and Eastern Europe. Therefore, it is

possible that in countries like Portugal, with less experience in managing R & D projects in the countries of North and Central Europe, investment in R & D have a positive impact on the performance of SMEs, but only above a certain intensity level.

The effect of experience in managing R & D projects can be decisive to increase the growth of high-tech SMEs. Several factors can contribute to investment in R & D with major importance for the growth of high-tech SMEs compared to low-tech SMEs, namely: (i) the shorter product life cycle and the high cost of investment in R & D with its entry barriers through sunk costs, which on the one hand, reduce competition faced by high-tech SMEs and, on the other hand, creates a need to diversify activities; (ii) continuous, rather than occasional, the investment by high-tech SMEs can grow more efficient strategies for leadership and management of R & D projects of the companies; (iii) the most qualified human resources can be a determinant in the high-tech SMEs, more efficient management of R & D projects; (iv) higher absorption capacity, ie the internal organization can be a determining factor in the high-tech SMEs to promote more effective use of good management practices in R & D projects; and (v) greater capacity to implement cooperation strategies with similar companies and may thus allow the acquisition of benchmarks (process in search of best practices in a given industry and leading to superior performance).

Audretsch et all (2004) found that R & D is important to stimulate the growth of companies, which may involve a greater ability to diversify activities. The fact that the business scale is relatively higher in the high-tech enterprises, the positive effects of intensive R & D can also help these companies to reach a minimum efficient scale that ensures the survival of a faster way.

According to Montgomery (1994), the R & D generates high costs, consequently, it can serve as a barrier to entry for new market entrants. Therefore, due to less competition, the existing companies will have greater opportunities for growth and may therefore have higher growth rates.

Classical economics indicates that business growth will occur as a result of changes in technology. Improved technology now allows the production resources more efficiently which reduces the cost and / or enables the creation of improved products. This company will be able to beat the competition by reaching new markets, which leads to its expansion. Variyan & Kraybill (1994), a study of companies in the southern United States, found that most business managers considered the use of technology as a critical element of competitive advantage. These companies, which place more emphasis on the use of new technologies, had higher growth rates than companies that did not have the technology as a critical factor. In addition, a cross-section of industries, Birley & Westhead (1990) found evidence to support the hypothesis that companies with latest technology in the main production lines, were associated with higher levels of growth and performance.

R&D expenditure may reveal to be fundamental to enhancing the growth of firms in general and in SMEs in particular. Therefore, it will be expected that is a positive impact of R&D expenditure in surviving SMEs growth. In non-surviving SMEs context, cannot make a efficient management of this type of expenditure, is expected not a positive impact of R&D expenditure on growth. Calvo (2006) concluded that innovative SMEs grow faster than non-innovative, ie there is a positive correlation between growth and R & D.

Based on the arguments presented, we formulated the following research hypothesis:

H3: For surviving SMEs the relationship between R&D expenditures and growth is positive this is not happening for non-surviving SMEs.

2.4. Cash Flow

According to Fazzari et all (1988), the cash flow is particularly important for financing companies, especially when the information asymmetry problems between the owners / managers of companies and lenders are pretty relevant. According to these authors, SMEs are more dependent on domestic financing to fund their activities, because it is more difficult access to external financing, compared to large companies. This difficulty of access to external financing has several consequences, such as: 1) higher probability of failure (Ang, 1992; Müller and Zimmermann, 2009); and 2) greater ease in changing the composition of its assets (Pettit and Singer, 1985).

In the context of SMEs, Carpenter & Petersen (2002), Honjo & Harada (2006), Oliveira & Fortunato (2006) and Maçãs Nunes et all (2013) concluded that the cash flow is a stimulating factor for the growth of the company.

Many companies have difficulty obtaining foreign capital in small amounts (Macmillan gap), even when they are able to get capital debt, have the effect of obtaining high interest rates (Storey, 1994). The inability of SMEs in raising external capital makes these companies resort to internal financing, this is because, as is the case in Portugal, only large companies (in general) have access to the stock market, causing the SMEs are with the most restricted credit choices. Carpenter & Peterson (2002) investigated the relationship between domestic financing and growth in a sample of small manufacturing companies, where they were able to conclude that growth, in most companies, was limited because of domestic financing.

However, it is argued that companies face external financing difficulties due to asymmetric information. In fact, a number of studies on the imperfections of the capital market have examined the impact of financial constraints on investment decisions and growth. For

example, Fazzari et all (1988) argue that financial constraints in the capital market affects investment and emphasized that the link between financial constraints and investment vary according to the type of company. In a more recent study, Wagenvoort (2003) uses financial data from more than 200,000 industrial and construction firms in Europe and concludes that European SMEs suffer from a structural funding problem that prevents their growth. In particular, we note that the financial difficulties are hampering the growth of small and very small businesses. Compared with large enterprises, SMEs are more limited by the availability of funding.

In external financing, there loans and the Exchange. As for loans, SMEs only have short-term law due to their size and risk of default. As for the stock market, the SMEs are inhibited from entering, however, if the SMEs to enter the stock market, have some disadvantages, such as the information market (total transparency of the business, with an audit of the accounting, obligation submit progress reports of the activity), loss of control, profit sharing, excess visibility (consequences of negative news regarding the fall of its shares), plus costs (commissions of the stock exchange).

For SMEs the internal financing sources has increased importance in the growth process. This importance may be much higher that the greater difficulty in accessing the external financing sources. Whereas the difficulties of access to external financing strongly influence the survival of SMEs, will be expected to assume that the internal financing has a greater relative importance for non-surviving SMEs that for surviving SMEs. Reid (2003) found that the growth strategies of SMEs can be affected by funding constraints. In fact, compared with large enterprises, SMEs have more limited access to external financing as a result of greater information asymmetry with creditors.

Based on the arguments presented, we formulated the following research hypothesis:

H4: Internal financing assumes greater relative importance for the growth of non-surviving SMEs than for growth of surviving SMEs.

2.5. Debt

The results obtained by Cooley & Quadrini (2001) and Cabral & Woods (2003), show that the growth of new small businesses is hindered by financial constraints and the lack of diverse resources.The strategies of SMEs to finance are key to explaining their growth and, therefore, can be seriously impaired when companies are subject to considerable financial constraints (Reid, 2003).

The companies support different domestic financing costs and external financing due to imperfections in the capital markets (Stiglitz and Weiss, 1981). If the capital market is perfect, then all companies would have access to alternative sources of financing and, therefore, internal financing and external financing. As a result, corporate financing decisions would be irrelevant to the performance of their investment strategies and growth (Stiglitz and Weiss, 1981). In the context of capital market imperfections, the results obtained by Fazzari et all (1988) are particularly relevant: SMEs face more restrictions on access to external financing and therefore are much more dependent on internal financing in order to finance their investments and, therefore, their growth.

In situations where domestic financing is insufficient to finance all growth opportunities, access to loans prevents excessive stress on the management of financial resources and may be essential for further growth in SMEs (Meyer, 1998).

However, according to Müller and Zimmermann (2009), the lowest quality of information provided to creditors on the specific characteristics of companies can lead to more restricted credit conditions. Therefore, they argue that this problem is particularly relevant for SMEs.

As for external financing, debt can influence the growth of the company (Lang et all, 1996). In large companies, the debt is essential to discipline the behavior of managers, so that they do not invest in projects that make the company grow beyond the optimal level, which would adversely influence the value of the company (Meyer, 1998).

However, the ownership and management of SMEs are generally concentrated in the same individuals, which contributes decisively to minimize conflicts between entrepreneurs and managers (Pettit & Singer, 1985; Crutchley & Hansen, 1989; Ang, 1992; Jensen et all 1992; Cowling, 2003).

According to Baker & Nelson (2005) and George (2005), when SMEs resort to debt, they tend to manage their financial resources efficiently because of the need to pay the debt and its charges. According to these authors, the efficient management of financial resources and debt, can have a positive effect on the growth of SMEs.

Empirical evidence shows the importance of domestic financing for SME growth, pointing to a positive relationship between growth and internal funding, different economies, including Germany (Audretsch & Elston, 2002), United States (Carpenter & Petersen, 2002), Portugal (Oliveira & Fortunato, 2006) and Spain (Moreno & Casillas, 2007). However, the analysis by Heshmati (2001), concerning Sweden, did not detect a significant effect on domestic financing in relation to growth. In turn, the study of Honjo & Harada (2006), applied to the situation in Japan, stresses the importance of domestic financing for the growth of young

companies, although there was no statistically significant relationship detected between the growth of the oldest companies and level of domestic financing.

However, empirical evidence does not indicate a positive effect between debt and growth in business. Heshmati (2001) for Sweden, get inconclusive results, emphasizing the variability of results, according to the estimation method and extent size used. Becchetti & Trovato (2002) for Italy, show a negative relationship between growth and debt, statistically significant when considering survivors and companies. However, the relationship referred to is not considered statistically significant when only the surviving companies. Honjo & Harada (2006), to Japan, get a negative and statistically significant relationship between growth and debt. However, the authors detect a positive and statistically significant relationship between growth and debt when considering the sales of companies such as measuring the size.

It is argued that SMEs have little information about the company, leading thus to have higher average growth rates, but with a more limited funding. Therefore more dependent on bank loans. For a bank, the limited information available about the company, increases the risk associated with providing financing, which induces the bank to reduce the maturity of the loan and increase the interest rate. To improve the conditions of the loan, SMEs should build a relationship with your bank in order to minimize the information asymmetry. The relationship between the maturity of bank debt and loans, was investigated by Ortiz-Molina & Feathers (2004) and Hernández Cánovas & Koëter Kant (2008), where they obtained several conclusions. Hernández Cánovas & Koëter Kant (2008) found that the control of specific firm characteristics such as size, age, financial situation and debt, increasing the possibility of obtaining long-term bank loans. However, as has heterocedasticidades can assume that the empirical evidence shows that loans and its effects on the maturity of bank loans to SMEs is affected by factors specific to each country. Based on similar arguments, Ozkan & Ozkan (2004) argue that building relationships with financial institutions will improve the ability of firms in access to external financing. This makes companies more bank debt, are able to more easily external financing.

In insufficiency of internal financing, access to debt could prove critical to the financing of SME activity. Such is because, in general, SMEs are unlisted and are very reluctant to open the capital to external investors, by so as not to lose control of the property and the management. Thus, the difficulties of access to debt could prove decisive for the failure of SMEs. Survivors For surviving SMEs, they can do an efficient debt management, we expect a positive impact of debt on growth, this is not happening for non-surviving SMEs. According to Fagiolo & Luzzi (2006), the financial liquidity is particularly important in the context of SMEs, so that this type of company to manage financial resources efficiently, with easy adaptation to rapid changes that may occur in their markets. The possibility of SMEs that generate financial resources, in particular debt, efficiently may imply a positive effect of debt on growth of SMEs.

Based on the arguments presented, we formulated the following research hypothesis:

H5: For surviving SMEs the relationship between debt and growth is positive this is not happening for non-surviving SMEs.

2.6 Government Subsidies

Hyytinen & Toivanen (2003), Siegel et all (2003), Smith (2010), and Serrasqueiro et all (2011) concluded that public funding is highly relevant to the activity of SMEs. In this context, Smallbone et all (2010) concluded that when SMEs are financially constrained, government grants are specifically relevant to SME growth and survival.

Economic theory argues that governments should finance SMEs through grants, especially those that are technology intensive (Lerner, 1999). This is because, first, the theory of public finance, argues that SMEs are an important source of new ideas and growth that generate positive externalities for other industries and companies, allowing economic growth. An example of this is when there is social return of SMEs that invest heavily in R & D, and thus outperform their private returns because of "dissemination of knowledge" (Griliches, 1992), thus leading companies to invest less in R & D. Secondly, the capital market imperfections can restrict investment and the growth of SMEs.

According to Peng (2003) and Manolova et all (2008), SMEs, due to their small size, are particularly exposed to changes in the economic climate. These authors concluded that in an unfavorable economic climate, government grants can add importance to SMEs in particular financial difficulties and thus can invest and therefore grow.

The empirical evidence obtained by Mason & Brown (2013) indicates that government grants are a positive factor in the growth of SMEs. Government grants mainly serve to improve the company's performance. Previous studies, such as, Gale (1991) and Schwartz & Clements (1999), have shown their importance. Becchetti and Trovato (2002) investigated the impact that subsidies have on the growth of Italian companies in a sample, using a dummy variable to indicate that the company received subsidies and have high rates of growth.

In insufficiency of internal financing, and difficult access to external financing, government subsidies may prove important for the growth of SMEs. Considering that non-surviving SMEs have particular difficulties in accessing external finance, government subsidies may be of particular relevance for growth of these firms in comparison to what may happen in the context of surviving SMEs. Smallbone, Welter, Voytovich & Egorov (2010) concluded that the need to deal with possible funding constraints contributes to government grants to be

important for the growth and survival of SMEs. Serrasqueiro et all (2011) concluded that the information asymmetry problems between the owners / managers and creditors would affect a particular service in SMEs. For this reason, Serrasqueiro et all (2011) suggest that specific policies should consider the services of SMEs with insufficient domestic financing to meet their financing needs.

Based on the arguments presented, we formulated the following research hypothesis:

H6: Government subsidies assumes greater relative importance for the growth of non-surviving SMEs than for growth of surviving SMEs.

2.7 Labour Productivity

Several authors (Low & MacMillan, 1988; Storey, 1994;. Baum et all, 2001) concluded that the company's success is due to the growth of the same. When there are high levels of vertical integration, diversification of activities and product diversification, can lead to high growth rates of the company (Delmar et all, 2003). On this subject, Rogers (2004) found when it improves the company's performance, this will lead to a greater possibility of investment in innovation, thus leading to larger enterprises.

From a certain level of scale, the marginal increase in performance of companies is becoming smaller as the size increases (Russeeuw, 1997). In this regard, concludes Yoon (2004) that a significant increase in growth can result in decreased performance of the companies if this growth will provide surplus of ideal size. On the one hand, managers and owners, are expected to have additional economic gains as a result of the growth of companies. On the other hand, the higher growth can lead to uncertainty, consequently the possibility of property owners for control from the outside, which may lead to decreased work productivity (Davidsson, 1989; Delmar et all, 2003; Wiklund et all 2003). Wiklund et all (2003) concluded that the informal working relationships are particularly relevant for the smaller companies. According to the authors, the increased growth can become unviable in these informal labor relations, contributing to the reduction of labor productivity.

In this context, Rogers (2004) concluded that the increased rigidity of labor relations in the context of large companies can contribute to the reduction of labor productivity, therefore, do not require growth as it contributes to increased productivity workers. Also according to Rogers (2004), the lowest organizational rigidity that characterizes the smaller companies are more effective in taking advantage of good investment opportunities associated with the innovation process, contributing to the increase in labor productivity. According Greiner (1972), the effects of growth in labor productivity can be positive or negative. If growth is

associated with an increase in employee motivation, due to the expectation of higher future earnings and informal relationships between employees is not substantially affected, then growth may contribute to the increase in labor productivity. If growth contribute to a less efficient action employed by owners / managers, and control also a relevant breakdown of informal labor relations, growth can contribute to a decrease in labor productivity. The conclusions of Greiner (1972) are proven by Rollag (2001). The author relates that when the growth of SMEs is substantial, resulting in significant organizational changes, the owners / managers of SMEs must motivate and assign responsibilities to employees, so that there is no decline in labor productivity. The results obtained by Wiboonchutikula (2002) indicate that SMEs with higher growth rates have higher labor productivity than SMEs with lower growth rates. These results indicate a relationship between labor productivity and growth of SMEs that are reinforced by Albert et all (2005) and Lopez-Gracia & Puente (2012), which concluded that labor productivity allows for increased production efficiency and may contribute to further growth in SMEs.

This evidence indicates the association between labor productivity and growth in the context of SMEs. The empirical evidence obtained by Mateev & Anastasov (2010), Lopez Gracia & Puente (2012), and Maçãs Nunes et all (2013) indicate that labor productivity is a positive determinant of the growth of SMEs. Lang & Majumder (2004) concluded that the effects of experience and learning are key factors for the efficiency of labor productivity factor, so as to provide a positive effect on the growth of SMEs. In fact, in the first years of activity, given the higher probability of bankruptcy, SMEs are concerned, above all, to achieve a minimum efficient scale to enable them to survive in their markets. In later stages of the life cycle, when SMEs are more firmly established in their markets, then we can expect that there is a higher labor productivity, to lead to diversification strategies. Such diversification strategies may contribute to increased growth at later stages of the life cycle of SMEs.

In the SMEs context, labour productivity may be particularly relevant for increased efficiency. Be expected that, for surviving SMEs has a positive impact of labour productivity on growth, as a result of greater efficiency translate into higher levels of growth. For non-surviving SMEs is possible that the less efficient human resource management contribute to the productivity of labour does not become reality in higher levels of growth. The empirical evidence on the influence of the growth performance of SMEs, considers operating income as a performance measure, indicating a positive relationship or a negative relationship between growth and performance. Chandler & Jensen (1992), Wiklund (1999), Mendelson (2000) and Hood (2004), had a positive relationship between growth and performance. Have Roper (1999) and Markman & Gartner (2002) find a negative relationship between growth and performance.

Based on the arguments presented, we formulated the following research hypothesis:

H7: For surviving SMEs the relationship between labour productivity and growth is positive this is not happening for non-surviving SMEs.

Chapter 3

Methodology

3.1 Database

This study uses the SABI (Analysis System of Iberian Balance Sheets) database from Bureau van Dijks for the period 2000-2009.

As our subject of analysis is SMEs, we select sample firms based on European Union recommendation L124/36, (2003/361/CE). According to this recommendation, a firm is considered an SME when it meets two of the following three criteria: 1) fewer than 250 employees; 2) annual total assets under 43 million euros; and 3) business turnover under 50 million euros.

Given that our goal is to analyse the growth determinants of surviving SMEs and non-surviving SMEs in the market during the period of analysis (2000-2009), we consider SMEs surviving in the market, i.e., those in the market during the whole period of analysis (2000-2009) as well as those entering the market during that period (2000-2009) and those leaving the market in that period (2000-2009).

The final samples of surviving and non-surviving SMEs are made up respectively of: 1) 1830 surviving SMEs, corresponding to 14625 observations; and 2) 406 non-surviving SMEs, corresponding to 2014 observations.

3.2. Variables

As dependent variable we consider sales growth, given by the difference between the sales logarithm in the present and previous periods.

Just as in other studies about the determinants of firm growth (Honjo & Harada, 2006; Oliveira & Fortunato, 2006; Lotti et all, 2009; Bannò & Piscitello, 2010; Rogers et all 2010; Maçãs Nunes et all, 2013), we consider as independent variables: size, age, R&D expenditure, cash flow, debt, government subsidies and labour productivity.

Monetary variables are deflated according to inflation in Portugal. We construct a price index from 2000 to 2009, considering 2009 as the base year. The following table presents the variables used in this study, together with their corresponding measures.

Table 2. Variables and Measures

Variables	*Measures*
Growth (GROW $_{i,t}$)	Difference between Logarithm of Sales in Present and Previous Period
Size (SIZE $_{i,t}$)	Logarithm of Sales
Age (AGE $_{i,t}$)	Logarithm of the Number of Years since Starting Activity
Research and Development (R&D $_{i,t}$)	Ratio of R&D expenditure to Total Assets
Cash Flow (CF $_{i,t}$)	Ratio of the sum of Net Results with Repayments to Total Assets
Debt (LEV $_{i,t}$)	Ratio of Total Liabilities to Total Assets
Government Subsidies (GS $_{i,t}$)	Ratio of Government Subsidies to Total Assets
Labour Productivity (L.PROD $_{i,t}$)	Ratio of VAG to Number of Employees

3.3. Estimation Method

Initially, we only consider as determinants of SME growth size in the previous period and growth in the previous period**1**, seeking to test Gibrat's Law in isolation. The regressions can be presented as follows:

$$GROW_{i,t} = \beta_0 + \lambda GROW_{i,t-1} + \beta_1 SIZE_{i,t-1} + \kappa_S D_S + \vartheta_t d_t + e_{i,t}, \quad (1)$$

in which: $GROW_{i,t}$ is the growth of firm i, in the current period; $GROW_{i,t-1}$ is the growth of firm i in the previous period; $SIZE_{i,t-1}$ is the size of firm i in the previous period; D_S is the sectoral dummy variable, and just as Blanco-Mazagatos et al. (2007) we consider the following sector dummy variables: agriculture; forestry and fishing; construction industry; manufacturing industry; wholesale and retail; and services); d_t represents annual dummy variables measuring the impact of possible macroeconomic changes on growth; and $e_{i,t}$ is the error term.

If $\beta \approx 0$ Gibrat's Law is not rejected, with rejection of Gibrat´s Law if $\beta \neq 0$.

[1] Chesher (1979) concludes that autocorrelation of errors can bias the results obtained for relationships estimated between current growth and previous size. So as to prevent error autocorrelation implying bias of estimated results, we introduce growth in the previous period in the regressions as an additional determinant of growth in the current period.

Afterwards, we estimate the regressions of the growth of surviving and non-surviving SMEs, considering all the determinants used in this study. Therefore, we estimate the following regressions:

$$GROW_{i,t} = \beta_0 + \lambda GROW_{i,t-1} + \beta_1 SIZE_{i,t-1} + \gamma_1 AGE_{i,t-1} + \gamma_2 R\&D_{i,t-1} + \\ + \gamma_3 CF_{i,t-1} + \gamma_4 LEV_{i,t-1} + \gamma_5 GS_{i,t-1} + \gamma_6 L.PROD_{i,t-1} + \kappa_S D_S + \vartheta_t d_t + e_{i,t} \quad , \qquad (2)$$

in which: $AGE_{i,t-1}$ is the age of firm i in the previous period; $R\&D_{i,t-1}$ is the Research and Development expenditure of firm i in the previous period; $CF_{i,t-1}$ is the cash flow of firm i in the previous period; $LEV_{i,t-1}$ is the total debt of firm i in the previous period; $GS_{i,t-1}$ is the government subsidies of firm i in the previous period; $L.PROD_{i,t-1}$ is the labour productivity of firm i in the previous period.

To estimate the regressions presented above, we use OLS regressions, estimating standard deviations of the parameters consistent with the possible existence of heteroskedasticity (this is the methodology used by various authors in studies about the determinants of firm growth, for example: Calvo, 2006; Honjo & Harada, 2006 and Lotti et all, 2009).

To test the difference in the estimated parameters, concerning the relationships between determinants and growth in surviving and non-surviving SMEs, we use the Chow test. The null hypothesis is the equality of estimated parameters.

Chapter 4

Results

The following table presents the descriptive statistics of the variables used in this study.

Table 3. Descriptive Statistics

	Surviving SMEs				*Non-Surviving SMEs*			
Variables	**Firm´s**	**N**	**Mean**	**S.D.**	**Firm´s**	**N**	**Mean**	**S.D.**
$GROW_{i,t}$	1830	14625	0,11198	0,39192	406	2014	0,03034	0,21019
$SIZE_{i,t}$	1830	14625	15,4391	0,26818	406	2014	14,4281	0,24818
$AGE_{i,t}$	1830	14625	2,56181	0,27616	406	2014	2,39010	0,24515
$R\&D_{i,t}$	1830	14625	0,00738	0,03276	406	2014	0,00681	0,03094
$CF_{i,t}$	1830	14625	0,06718	0,16515	406	2014	0,05581	0,15157
$Lev_{i,t}$	1830	14625	0,65617	0,22067	406	2014	0,68718	0,23671
$GS_{i,t}$	1830	14625	0,00918	0,03424	406	2014	0,00946	0,03817
$L.PROD_{i,t}$	1830	14625	20,3991	63,4747	406	2014	17,4019	59,0716

Based on the descriptive statistics, we can conclude that: 1) on average, surviving SMEs have greater growth, size, age, R&D expenditures, cash flows and labour productivity than non-surviving SMEs; and 2) on average, non-surviving SMEs have greater debt and government subsidies than surviving SMEs.

Gujarati and Porter (2010) conclude that the problem of collinearity between explanatory variables may be particularly relevant, when the correlation coefficients between variables are over 50%. As we can see from Tables A1 and A2, corresponding to the correlation matrices between the variables used in this study, for surviving and non-surviving SMEs, respectively, irrespective of taking the former or the latter as the object of analysis, the correlation coefficients between the independent variables are in no circumstances over 50%, and so the problems of possible collinearity between independent variables will not be particularly relevant.

The following table presents the results referring to the relationships between determinants and growth in surviving and non-surviving SMEs.

Table 4. Growth Determinants – Surviving SMEs and Non-Surviving SMEs

	Dependent Variable: GROWi, t			
	Surviving SMEs		**Non-Surviving SMEs**	
Independent Variables	**I**	**II**	**I**	**II**
GROW $_{i, t-1}$	0,07819 **	0,07514 **	0,01413	0,01237
	(0,02011)	(0,01351)	(0,01977)	(0,01881)
SIZE $_{i, t-1}$	-0,05671 **	-0,052383 **	0,01212	0,01409
	(0,01012)	(0,01258)	(0,03145)	(0,02987)
AGE $_{i, t-1}$		-0,2898 **		-0,01022
		(0,00635)		(0,01541)
R&D $_{i, t-1}$		0,27819 **		-0,11909 *
		(0,07810)		(0,05770)
CF $_{i, t-1}$		0,43422 **		0,89186 **
		(0,10637)		(0,16712)
Lev $_{i, t-1}$		0,27818 *		-0,17422 **
		(0,13561)		(0,05616)
GS $_{i, t-1}$		0,40817 **		0,08911
		(0,10515)		(0,09724)
L.PROD $_{i, t-1}$		0,05189 **		0,01718
		(0,01263)		(0,02818)
CONS	0,02617 **	0,00819	0,04676 **	0,02192 *
	(0,00718)	(0,01312)	(0,01073)	(0,01248)
R^2	0,1061	0,3981	0,0110	0,1573
Firms	1830	1830	406	406
Observations	12795	12795	1608	1608

Notes: 1. Robust Standard Deviations in parenthesis. 2. ** statistically significant at 1% significance;* statistically significant at 5% significance. 3. Estimations include sectoral dummy variables, but estimated parameters are not presented in the tables. 4. Estimations include annual dummy variables, but estimated parameters are not presented in the tables.

Regardless of the considerations of the total number of independent variables, we identify a negative relationship between size and growth in surviving SMEs. That relationship is statistically insignificant in non-surviving SMEs. Additionally, we verify a positive and statistically significant relationship between growth in the current and previous periods in surviving SMEs, that relationship being statistically insignificant in non-surviving SMEs.

Concerning the other relationships between determinants and growth, we find that for surviving SMEs: 1) age is a restrictive determinant of growth; and 2) R&D expenditure, cash flow, debt, government subsidies and labour productivity are determinants that stimulate growth.

As for non-surviving SMEs, we find that: 1) R&D expenditure and debt are restrictive determinants of growth; 2) cash flow is a determinant stimulating growth; and 3) age, government subsidies and labour productivity neither restrict nor stimulate growth.

The following table presents the results of the Chow test of possible differences between the parameters measuring relationships between determinants and growth in surviving and non-surviving SMEs.

Table 5. Chow Test – Growth Determinants –Surviving SMEs and Non-Surviving SMEs

	Estimated Parameters: Surviving SMEs versus Non-Surviving SMEs	
Independent Variables	**I**	**II**
GROW $_{i,\ t-1}$	16,56 **	16,12 **
	(0,00)	(0.00)
SIZE $_{i,\ t-1}$	18,44 **	17,04 **
	(0,00)	(0.00)
AGE $_{i,\ t-1}$		15,21 **
		(0.00)
R&D $_{i,\ t-1}$		32,19 **
		(0.00)
CF $_{i,\ t-1}$		13,34 **
		(0.00)
LEV $_{i,\ t-1}$		30.33 **
		(0.00)
GS $_{i,\ t-1}$		15,91 **
		(0.00)
L.PROD $_{i,\ t-1}$		14,12 **
		(0.00)
Global Difference I	17,90 **	
	(0.00)	
Global Difference I		26,56 **
		(0.00)

Notes: 1. ** significant at 1% significance. 2. Probabilities in parenthesis.

We can confirm that, irrespective of the regression estimated, for each of the determinants considered, we reject the null hypothesis of equality of estimated parameters measuring the relationships between determinants and growth. For each regression estimated, the global results of the differences of estimated parameters confirm the rejection of the null hypothesis of equality of the estimated parameters, measuring the relationships between determinants and growth, in surviving and non-surviving SMEs.

It should be noted that although cash flow is a positive determinant of surviving and non-surviving SMEs, we conclude on the basis of the results presented in Table 3 that the parameter measuring the relationship between cash flow and growth is of a greater magnitude in non-surviving SMEs (0.89186) than in surviving SMEs (0.43422). The results of the Chow test, presented in Table 4, confirm that the difference in the estimated parameters are statistically significant, confirming the greater relative importance of cash flow for growth in non-surviving SMEs than in surviving SMEs.

Chapter 5

Discussion of Results

For surviving SMEs, we identify a negative relationship between size and growth. However, the relationship between those two variables is not statistically significant for non-surviving SMEs. This allows us conclude that small surviving SMEs grow faster than large surviving SMEs, then Gibrat´s Law is rejected. Oppositely, Gibrat's Law cannot be rejected for non-surviving SMEs, given that growth in these SMEs is independent of size.

The conclusions of Gibrat (1931) are valid for non-surviving SMEs, which suggests that these SMEs may have particular difficulties in growing, and they do not manage to reach a minimum scale of efficiency to allow their survival in their operating markets. The statistically insignificant relationship between growth in the previous period and growth in the current period appears to corroborate this conclusion, indicating that the growth process of non-surviving SMEs is not continuous, i.e., it is not persistent.

In the case of surviving SMEs, the conclusions of Sutton (1997) and Audrestsch et all (2004) are valid, since the results indicate that SME growth is not independent of size, with small SMEs growing faster than large ones. The higher growth rate of small surviving SMEs will be a consequence of the need to reach as quickly as possible a minimum scale of efficiency that allows those firms to survive in their operating markets. The positive relationship between growth in the previous period and growth in the current period in surviving SMEs shows that the growth process is persistent and continuous, strengthening the idea that these SMEs manage to achieve a growth rate over time so as to reach a minimum scale of efficiency that allows them to survive.

In the majority of empirical studies focusing on SMEs (Becchetti & Trovato, 2002; Yasuda, 2005; Calvo, 2006; Honjo & Harada, 2006; Oliveira & Fortunato, 2006; Lotti et all, 2009; Bentzen et all, 2012; Coad & Tamvada, 2012; Lopez Gracia and Puente, 2012; Maçãs Nunes et all, 2013), Gibrat´s Law is rejected. In this study, that result is obtained in the case of surviving SMEs, but not when our subject of analysis is non-surviving SMEs.

The results concerning the relationship between age and growth reinforce the empirical evidence presented above. Indeed, we conclude that young surviving SMEs grow faster than old surviving SMEs, corroborating the conclusions of Jovanovic (1982) and Fariñas & Moreno (1997), that firms, in the start of their life-cycle, grow faster than firms in a later life cycle stage.

Regarding the relationship between age and growth, the empirical evidence obtained here for surviving SMEs corroborates that obtained by Becchetti & Trovato (2002), Yasuda (2005), Calvo (2006), Honjo & Harada (2006) Oliveira & Fortunato (2006), Lotti et all (2009), Coad & Tamvada (2012) and Maçãs Nunes et all (2013), but the same does not occur, when our subject of analysis is non-surviving SMEs.

R&D expenditure is a determinant stimulating growth in surviving SMEs, but a restrictive determinant of growth in non-surviving SMEs.

The positive effects of R&D, namely: 1) greater capacity to diversify activities (Montgomery, 1994; Deloof, 2003; Rogers, 2004); 2) greater export capacity, and consequently diminished business risk (Beise-Zee & Rammer, 2006); and 3) greater capacity to establish cooperative networks with other SMEs (Rogers, 2004; Rickne, 2006), seem to be particularly relevant for increased growth in surviving SMEs. The foreseeable negative effects of R&D expenditure: 1) activities associated with R&D expenditure have a high level of risk, and so financing these activities, when internal finance is insufficient, may be difficult due to lenders hindering access to credit, preventing growth opportunities from being efficiently exploited (Yasuda, 2005; Müller & Zimmermann, 2009); 2) for SMEs to be able to use R&D expenditure efficiently, they need a learning process that may take time, which may imply diminished growth in SMEs that have not yet acquired considerable experience in managing R&D projects (Müller & Zimmermann, 2009); and 3) compared to large firms, SMEs are less able to manage R&D projects due to the difficulty in hiring qualified human resources (Freel, 2003; Tanabe & Watanabe, 2005), which seems to contribute to diminished growth in non-surviving SMEs.

Cash flow is a determinant stimulating growth in both surviving and non-surviving SMEs, but it is of greater relative importance in the case of non-surviving SMEs. The greater dependence on internal finance in non-surviving SMEs to fund their growth may be due to the particular difficulties faced by these firms in accessing external finance, as forecast by Fazzari et all (1988).

Although cash flow is of greater relative importance for growth in non-surviving SMEs than in surviving SMEs, the positive relationship between cash flow and growth, in both types of SME, corroborates the empirical evidence obtained by Carpenter & Petersen (2002), Honjo & Harada (2006), Oliveira & Fortunato (2006) and Maçãs Nunes et all (2013).

Debt is a determinant stimulating growth in surviving SMEs, but it is a restrictive determinant of growth in non-surviving SMEs. This empirical evidence indicates that: 1) as a consequence of a possibly poorer quality of information provided to creditors, non-surviving SMEs may have particular difficulty in accessing debt compared to the case of surviving SMEs (Müller & Zimmermann, 2009), and 2) surviving SMEs may manage external finance more efficiently than non-surviving SMEs (Baker & Nelson, 2005; George, 2005).

Government subsidies are a positive determinant of growth in surviving SMEs, but are neither a positive nor a negative determinant of growth in non-surviving SMEs. These results indicates that the importance of government subsidies for SME activity (Hyytinen & Toivanen, 2003; Siegel et all, 2003; Smith, 2010; Serrasqueiro et all 2011) is especially pronounced in surviving SMEs, but it is of little relevance in non-surviving SMEs. The fact of government subsidies, being a determinant stimulating growth in surviving SMEs, but not in non-surviving SMEs, indicates the greater efficiency of the former, in managing government subsidies.

Labour productivity is a positive determinant of growth in surviving SMEs, but it is neither a positive nor a restrictive determinant of growth in non-surviving SMEs. These results indicate that higher productivity only implies greater growth (Wiboonchutikula, 2002; Albert et all, 2005; Lopez-Gracia & Puente, 2012) for surviving SMEs, revealing that only this type of firm manages to turn greater productive efficiency into growth. This is not verified by non-surviving SMEs that may be decisive for these SMEs do not reach a minimum scale of efficiency, which will allow their survival in the operating markets.

Chapter 6

Conclusions and Implications

Considering two samples of SMEs: 1) 1830 surviving SMEs; and 2) 406 non-surviving SMEs, and using OLS regressions estimating standard deviations consistently with the possibility of heteroscedasticity, this paper contributes to the literature testing whether the growth determinants of surviving SMEs are different from those of non-surviving SMEs.

The empirical evidence obtained in this study allows us to conclude that the growth determinants of surviving SMEs are different from those of non-surviving SMEs. Firstly, for surviving SMEs, the negative relationship between size and growth allows us to conclude that smaller surviving SMEs grow faster than larger surviving SMEs, i.e. Gibrat's Law is rejected. These results are not verified in non-surviving SMEs, since the relationships between size and growth is not statistically significant, i.e. Gibrat's Law cannot be rejected. Secondly, for surviving SMEs, the negative relationship between age and growth allows to us conclude that the youngest surviving SMEs grow faster than older surviving SMEs, a result that is not verified in non-surviving SMEs, where a statistically insignificant relationship is verified between age and growth. Thirdly, R&D expenditure, debt, labour productivity and government subsidies are determinants promoting growth in surviving SMEs. As for non-surviving SMEs, R&D expenditure and debt are restrictive determinants of growth in these firms, with labour productivity and government subsidies being neither positive nor restrictive determinants of growth. Fourthly, cash flow is a determinant stimulating growth in both surviving and non-surviving SMEs, but is of greater relative importance for growth in non-surviving SMEs than in surviving SMEs.

The results are very important for non-surviving SMEs, indicating that these firms are not able to carry out efficient management of R&D projects, debt and government subsidies. Furthermore, labour productivity does not correspond to effective growth. Besides the above, it is noted that non-surviving SMEs are particularly dependent on internal finance to fund their growth. Therefore, the firm´s growth may be threatened, in situations of insufficient internal funding.

Portugal has a bank-based financial system, where SMEs are especially relevant for job creation and potential economic growth, but these firms, in general, do not have access to the capital market, and consequently have limited financing possibilities. In such a situation, and with SME bankruptcy being especially worrying in present, the empirical evidence obtained in this study allows us to suggest economic policy measures, intending to contribute to lessening that problem. In terms of economic policy, effective support is suggested for SMEs with good investment projects, to encourage the hiring of staff specialized in managing

financial resources, R&D projects and human resources, so that external finance, government subsidies, R&D expenditure and labour productivity can contribute to SME growth. That growth should be persistent over time, allowing them to reach a minimum scale of efficiency that allows them survive in their operating markets.

This study has two main limitations. Firstly, the absence of data regarding the specific relationships between SME owners/managers and creditors (e.g. banks and suppliers). Secondly, the impossibility to access to detailed data, which would allow us to introduce several variables regarding SME ownership and management to analyze their influence on SMEs' financing decisions, and consequently on their growth.

Considering these limitations we suggest for future research, to analyze if specific relationships between SME owners/managers and creditors as well as SME ownership and management influence SME financing decisions, and consequently their growth.

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Appendix: Correlations Matrix

Table A 1. Correlation Matrix – Surviving SMEs

	$GROW_{i,t}$	$GROW_{i,t-1}$	$SIZE_{i,t-1}$	$AGE_{i,t-1}$	$R\&D_{i,t-1}$	$CF_{i,t-1}$	$LEV_{i,t-1}$	$GS_{i,t-1}$	$L.PROD_{i,t-1}$
$GROW_{i,t}$	1								
$GROW_{i,t-1}$	0.189**	1							
$SIZE_{i,t-1}$	-0.271**	-0.114**	1						
$AGE_{i,t-1}$	-0.237**	-0.089**	-0.231**	1					
$R\&D_{i,t-1}$	0.118**	0.023*	0.167**	0.010	1				
$CF_{i,t-1}$	0.341**	0.271**	0.090**	0.086**	0.039**	1			
$LEV_{i,t-1}$	0.091**	0.012	0.115**	0.023*	-0.1290**	-0.166**	1		
$GS_{i,t-1}$	0.154**	0.083**	-0.035**	0.087**	0.174**	-0.101**	-0.265**	1	
$L.PROD_{i,t-1}$	0.167**	0.037**	-0.025*	0.006	0.188**	0.009	-0.012	0.124**	1

Notes: 1. ** Statistically significant at 1%; * Statistically significant at 5%.

Table A 2. Correlation Matrix – Non-Surviving SMEs

	$GROW_{i,t}$	$GROW_{i,t-1}$	$SIZE_{i,t-1}$	$AGE_{i,t-1}$	$R\&D_{i,t-1}$	$CF_{i,t-1}$	$LEV_{i,t-1}$	$GS_{i,t-1}$	$L.PROD_{i,t-1}$
$GROW_{i,t}$	1								
$GROW_{i,t-1}$	0.011	1							
$SIZE_{i,t-1}$	0.012	0.014	1						
$AGE_{i,t-1}$	0.036**	0.024*	-0.037**	1					
$R\&D_{i,t-1}$	-0.172**	-0.143**	0.244**	-0.012	1				
$CF_{i,t-1}$	0.415**	0.278**	0.113**	0.035**	0.128**	1			
$LEV_{i,t-1}$	-0.316**	-0.265**	0.280**	-0.008	-0.256**	-0.273**	1		
$GS_{i,t-1}$	0.010	0.008	-0.139**	0.014	0.203**	-0.037**	-0.224**	1	
$L.PROD_{i,t-1}$	0.007	0.014	-0.023*	0.106**	-0.012	-0.023*	-0.026*	0.035**	1

Notes: 1. ** Statistically significant at 1%; * Statistical significant at 5%.