ARE THE IMPLICATIONS OF THE FINANCIAL GROWTH CYCLE CONFIRMED FOR SPANISH SMEs?

Javier Sánchez-Vidal[1], Juan Francisco Martín-Ugedo[2]

*Facultad de Ciencias de la Empresa, Universidad Politécnica de Cartagena,
Calle Real 3, 30201 Cartagena, Spain
E-mails: [1]javier.sanchez@upct.es (corresponding author); [2]juanfran@um.es*

Abstract. The aim of this paper is to analyze whether some of the empirical implications of the financial growth cycle hold in a sample of Spanish SMEs. We use a sample of 5,944 observations for the year 2007 and test several hypotheses using MANOVA analysis. The results show that companies tend to have different financing structures depending on their age and size. Hypotheses about trade credit, short term debt and risk are confirmed with respect to age, as the younger companies tend to use proportionally more trade credit and short term debt, and are riskier. Size is also associated in the expected way with trade credit, relative trade credit and relative short-term financial debt. On the other hand hypotheses about equity and the financing deficit are not confirmed. The effect of a pecking order behaviour over a long period of time may provide an explanation of why these two hypotheses are not confirmed.

Keywords: age, size, financial growth cycle, information asymmetries, corporate finance.

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1. Introduction

Capital structure is a recurrent topic in the financial literature. After the seminal work by Modigliani and Miller (1958), which argued that under perfect market conditions the decision about financing would be irrelevant, many studies have analysed the influence of tax considerations (Modigliani, Miller 1963; Miller 1977, among others) and financial distress (Baxter 1977; Warner 1977, among others) on the financial structure of companies. Following Jensen and Meckling (1976), many other studies considered the influence of information asymmetry and agency costs on firms' financial structures. The information asymmetry problem, in relation to financing decisions, refers to the fact that external investors have poorer information about the firm than managers and internal shareholders. A prime contribution on information asymmetry in capital structure theory is the Myers and Majluf (1984) model. Myers and Majluf argued that the empirical evidence is not consistent with the idea that companies adopt a financial

policy that is determined by a trade-off of advantages and disadvantages of debt. Rather, companies' financial policies seem to be better explained by the behaviour described by Donaldson (1961). He established a hierarchy describing company preferences for internal funds over external funds. In the case of external funds, a company prefers debt over the issue of equity.

To explain this behaviour, Myers and Majluf (1984) construct a model based on the assumption that a firm's managers act on behalf of the current shareholders. If companies have enough financial slack, they will make all the investments that have a positive net present value. If external funds are needed to finance new investments, the market will interpret equity issues as evidence that company shares are overvalued and thus issue announcements have a negative impact on share price. Thus, Myers and Majluf (1984) argue, if the company does not have enough funds to finance new investments, it will issue equity only when there are very profitable investments that can neither be postponed nor financed through debt, or when managers believe that the stock is sufficiently overvalued that shareholders will be disposed to tolerate the market penalty.

However, the Myers and Majluf (1984) model has some limitations. The first is that it applies to markets like the American market where shares are offered mainly through commitment underwritings and not through rights issues, which is the flotation method that prevails in most other markets. In an underwritten firm commitment, shares are offered simultaneously to the public at large. Thus, if shares are overvalued, there will be a wealth transfer from new to current shareholders. In rights offerings, current shareholders enjoy priority in the purchase of new shares, which minimizes the possibility of wealth transfers[1].

A major problem in SME financing, especially in non-Anglo-Saxon countries, is limited access to capital markets (a *finance gap*) (Holmes, Kent 1991). As a consequence, long-term financing is usually reduced to internal financing and bank loans, and this is particularly the case for SMEs. These factors (different issuance methods and finance gap) imply a similar hierarchy for SMEs in non-American markets to the one described by Myers and Majluf (1984). That is, the company would make use of retained earnings in the first place, then debt (bank loans) and, as a last resort, equity issues. In addition, Cressy and Olofson (1997) propose an alternative explanation for the pecking order hypothesis for European SMEs in which the management tries to minimise interference and ownership dilution, and in which trade debt and internal sources are employed first. As previously noted, the information asymmetry problem refers to the relatively poorer information that is available to external fund providers compared to the economic agents involved in the management of the enterprise. There are several variables that influence the level of information asymmetry in companies, and amongst the most important are age and size.

Age has been considered to be one of the main factors that help to mitigate or alleviate the information asymmetry problem. As a general rule, the older the company is,

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[1] Further details on the economic implications of different flotation methods can be found in Eckbo and Masulis (1995).

the more consolidated its business is considered to be and the more external investors know about the company's situation (Diamond 1989; Wijst 1989). This has been an approach adopted by numerous studies, although the one by Berger and Udell (1998) may be regarded as the most relevant. In their work they describe how the financial growth cycle influences the evolution of the company's financial structure over its life span[2].

Size is another variable that may help to mitigate the information asymmetry problem. This is because large companies are less risky, as they are usually more diversified (Warner 1977; Pettit, Singer 1985; Rajan, Zingales 1995). In addition, larger companies produce more accounting and financial information for creditors and investors in general (Fama 1985), which supports the intuition that it is less costly to control them.

The Spanish market is considered to be in the Continental System or Civil Law system, in contrast with the American market, which provides most of the available evidence and that belongs to the Common Law or Anglo-Saxon system. The differences between the two systems are large, but can be summarised in three points: companies in the Anglo-Saxon system tend to have a much more dispersed shareholder structures, there is more investor protection and the external control mechanisms are relatively strong (La Porta *et al.* 1998, 2002). These differences, in addition to the different methods for issuing equity, the greater financial gap, and the intention of the management to minimise interference and ownership dilution, may have an effect on how information asymmetries operate from one market to another. Consequently, the financial growth cycles may also differ. Previous studies have highlighted the presence of systematic differences in companies' capital structure in diverse countries, according to different institutional factors (López-Iturriaga, Rodriguez-Sanz 2007; Titman *et al.* 2010; Demirgüç-Kunt, Maksimovic 1998; Rajan, Zingales 1995; among others). Antoniou *et al.* (2008) argue that the capital structure of a firm is heavily influenced by the economic environment and its institutions, corporate governance practices, tax systems, the borrower-lender relationship, exposure to capital markets and the level of investor protection in the country in which the firm operates. Rajan and Zingales (2003) suggest strong differences in the financial markets among the European countries, and also in comparison with the US.

The aim of the present study is to test whether the implications of the financial growth cycle hold for a sample of Spanish SMEs. A number of studies have analysed the capital structure of Spanish companies. These include studies by Saá-Requejo (1996), López-Gracia and Aybar-Arias (2000), De Miguel and Pindado (2001), Sogorb-Mira (2005), and López-Gracia and Sogorb-Mira (2008). However, as far as we know, no-study has examined whether the financial growth cycle and its implications apply in Spain. This paper contributes to the growing number of country-specific studies on determinants of capital structure and financial growth cycle in SMEs by providing original empirical evidence from the Spanish case. This and other papers may help to build a framework of empirical evidence relating to the financial growth cycle that confirms or refutes this theory in different countries and contexts.

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[2] Berger and Udell's (1998) financial growth cycle is reproduced in Appendix 1.

The results show that companies have different financial structures depending on age and size. The hypotheses are confirmed in relation to trade credit and to some extent to short-term financial debt. The financing deficit is found not to vary significantly with the size of a company, and the relationship with age is the opposite of that expected, although the significance of this influence is weak. Risk behaves as predicted in relation to the age of companies, but size is found not to be significant. The most important failure of the financial growth cycle hypothesis relates to the equity variable, which is found not to decrease with the age or size of the company, a result that is mainly driven by a pecking order behaviour, as firms tend to accumulate considerable retained earnings with age.

The rest of this paper is structured in four sections. In Section 2 there is a description of the financial growth cycle, an exposition of the hypotheses studied, and a definition of the variables related to the hypotheses. Section 3 describes the sample, the definition of age and size groups and the methodology. In Section 4 there is a discussion of the results. Finally, in Section 5 we present the conclusions.

2. Theory and hypotheses

One of the milestone studies that have attempted to explain how a company's capital structure varies through its life is Berger and Udell (1998). These authors argue that companies follow a financial growth cycle, and that the driving force of this evolution is information asymmetry. They conceive a financial growth cycle in which older and larger firms exhibit less information asymmetry.

This information asymmetry problem interacts with the agency costs problem. These costs arise because managers (agents) are usually different from the people who provide funds (principals). This conflict of interests has implications for the firm's external financing, not only if conflict actually occurs, but also on account of the fact that it could happen. So, this potential problem may force creditors to decide not to lend (financing restrictions) or to increase the cost of external funds to offset that higher perceived risk. This in turn will cause the adverse selection problem (Stiglitz, Weiss 1981; Akerlof 1970). Facing this increase in the financing cost, companies will only carry out their riskier investment projects.

In addition, the potential appearance of these conflicts will encourage creditors to try to control the company's management before and during the debt contract, which produces so called monitoring costs. Agency costs may also result in moral hazard costs (Arrow 1963; Jensen, Meckling 1976): once the credit has been agreed, the managers/shareholders of the company may dedicate these resources to riskier investment projects, as their return maybe potentially higher and benefit exclusively shareholders, whereas creditors will receive the same, predetermined return but with an increased risk. Knowing this, creditors may decide not to lend, lend only a limited quantity or offer less favourable credit conditions in such a way that debtors may be not interested in borrowing any longer. This may impose financing restrictions and may force companies to abandon profitable investment projects.

We have formulated five hypotheses to test the financial growth cycle. These hypotheses are related to age and size and are presented jointly. This method of presentation is chosen because both variables exert an influence in the same direction with respect to the information asymmetry problem. Nevertheless, as there may be cases of young and large companies and/or old and small firms, we will examine the influence of each factor separately in the results section. In addition, in the two factor MANOVA results, the statistical value of the joint influence (interaction factor) of age and size is also presented (Table 3).

Equity is crucial for most companies as it is the main (and in some cases, the only) source of funding in case of financial frictions. Berger and Udell (1998) (see Appendix 1) and Mac an Bhaird and Lucey (2010) consider that funding from the principal shareholders and family connections are decisive in the early stages of younger companies, in combination with private equity markets (angel finance[3] and venture capital). In addition, a firm's reputation, its repayment history and its record of profitability can ameliorate the problem of asymmetric information and improve the company's access to external sources of funding, such as trade credit and bank debt (Diamond 1989; La Rocca *et al.* 2011). As small young firms do not have either reputation or track record, internal resources (from the entrepreneur or his or her family) become fundamental for the company. Size is also a mitigating factor of the information asymmetry problem. Smaller and more opaque companies will tend to finance with equity. Spain is a Civil-Law country, in which the private equity markets are underdeveloped: firms employ less angel finance and venture capital, because of the different development of the financial system (Zozaya González, Rodríguez Guerra 2007). This fact could make equity less important with respect to debt for a typical Spanish firm in the first stages of its life.

Therefore, our first null hypothesis is:

H1: Younger (and smaller) companies are more likely to finance with equity[4].

Equity is defined as funds contributed by shareholders and retained earnings scaled by total assets. Berger and Udell (1998) analyze the behaviour of the equity variable in a sample of American SMEs for the year 1993, splitting the sample into age and size groups. They find that, contrary to expectations, middle-aged and old companies show relatively higher values of equity. These authors believe this is due to the accumulation of retained earnings.

With respect to external debt, trade credit may play an important role, as younger SMEs may be more likely to face financial restrictions when they try to access other external funds. Bank debt is typically more readily available after a firm has built up significant tangible assets that can be collateralized. As a firm becomes larger and more mature,

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[3] A stage earlier than venture capital and considered to be less formal. Angel investors are usually found among an entrepreneur's family and friends, who provide direct finance to companies in their initial phase.

[4] Going public is another option contemplated in Berger and Udell's (1998) financial growth cycle for larger and older SMEs, and this could alter our hypothesis 1. But in Spain, given the narrowness of the equity markets which is typical for continental or banked-based financial system (De Miguel, Pindado 2001), this is a very unusual option, especially for SMEs.

and less informationally opaque, its financing choices change, including better access to the debt market (Chittenden *et al.* 1996). Consequently, smaller firms may be offered less debt (Cassar 2004) and at a higher cost than larger firms (Baas, Schrooten 2006). In addition, bankruptcy costs and size are inversely related (Cosh, Hughes 1994). Also, trade credit is usually more expensive (Petersen, Rajan 1995), so companies in the late stages of the financial growth cycle may be less inclined to resort to this type of credit.

Another issue that merits attention is the length of the relationship between a company and its bank(s). A long relationship may benefit the firm, as the financial creditor has better information about the company, improving its trust towards it, and resulting in a decrease of the cost of debt and greater availability of funds (Petersen, Rajan 1995; Boot, Thakor 1994). We can suppose that the older the company is, the higher the probability of having maintained a long relationship with financial institutions, and so the greater will be the availability of funds from financial institutions. This should cause companies to increasingly use more financial credit, reducing trade credit.

We calculate trade credit as commercial credit scaled by total assets.

We test this hypothesis with two different proxies:

H2a: Younger (and smaller) companies tend to use a higher proportion of trade credit in their financial structures (equity plus debt).

Given that total debt could change over the company's financial life, we employed a second proxy to test this hypothesis[5]:

H2b: Younger (and smaller) companies tend to use a higher proportion of trade credit with respect to their total debt ratio.

When referring to financial debt, the use of covenants in leverage contracts may be a useful instrument to cope with information asymmetry. Nevertheless, the effectiveness of these clauses will be lower for young SMEs, as, for example, their financial statements will merit less trust and there are greater difficulties in exerting effective control. Because of this, and with the aim of applying stronger and more effective control, companies are usually subject to shorter debt maturity, which allows for the renegotiation of the covenants on a regular basis. Therefore, we argue that the older and larger the company is, the higher the percentage of long-term debt over total financial debt that the company will employ. Although the evidence about the influence of a company's long term relationship with the bank is object of controversy, the predominant opinion is that the benefits exceed the costs (Sarno 2008), increasing the amount of long term funding and lowering the cost of this debt. If we define relatively short term financial debt as the proportion that this debt represents over total financial debt, we can formulate the following hypothesis:

H3: Younger (and smaller) companies will tend to have higher values of relative short term debt.

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[5] As previously indicated, Hypotheses 2a and 2b refer to the analysis of the same behaviour, calculated through two different proxies. Hypothesis 2b is a mere correction of Hypothesis 2a that will make full sense when explaining the results of the next section.

Small firms in Common Law countries are more likely to obtain bank loans of longer maturity compared to SMEs in countries under Civil Law (Hernández-Cánovas, Koëter-Kant 2008), and so, this hypothesis should be particularly true for our Spanish SMEs sample.

Berger and Udell (1998) argue that older, and larger companies, and companies that are more transparent in terms of information, have access to more varied sources of finance. So, the financing deficit (which is financed with long-term external finance, either equity or debt) is likely to be larger for older and larger companies. We define the financing deficit as investment in fixed assets, plus paid dividends and the increase in working capital, minus the cash flows generated by the company, scaled by total assets. All data in this calculation refer to the same year.

So, our fourth hypothesis is:

H4: Older (and larger) companies will tend to have larger financing deficits.

The issues considered by Berger and Udell (1998) may have to be modified and adapted for the Spanish case, as the large capital markets, either of debt or equity, are not so developed in Spain as in the countries of the Anglo-Saxon system (Hernando, Martínez Pagés 2001; Beck, Levine 2002). Although, in the Spanish market, older and larger companies may have better access to external finance, this may be relatively less important. In this sense, Benito (2003) thinks that a feature of the Anglo-Saxon system is the greater availability and use of new equity finance. This may result in a higher financing deficit for older and larger Spanish companies compared with the younger and smaller ones, but a lower deficit compared with those of firms in Anglo-Saxon countries.

One of the essential aspects referred to by Berger and Udell (1998), which underpins their reasoning about the financial growth cycle, is the company's risk. Risk makes the information opacity and agency cost problems worse. Jovanovic (1982) argues that the more mature an industry is, the more stable are the incomes of its companies. This is due, according to the author, to the fact that less profitable companies have probably failed in the earlier stages of the industry's life. As the less efficient companies disappear, the surviving companies will tend to have a less variable profitability. In addition, young and small firms, often run by novice entrepreneurs, are by their nature evolving organisms, which means that their sales and their profits will tend to fluctuate around the mean more than their larger counterparts (Cressy, Olofsson 1997), and they are, therefore, more risky. We will use the coefficient of variation of EBITDA (earnings before interest, taxes, depreciation and amortization) for the three year period that starts two years before the year of study to quantify this variability in income. A similar measure was employed by Hoyt (2011). We will examine the following hypothesis:

H5: Younger (and smaller) firms tend to be riskier.

Age and size can be considered to be variables associated with managerial growth, at least implicitly. Nevertheless, a number of authors consider growth in an explicit way. According to Gibrat's law, the growth of a company is considered to be independent of its size (Hart, Prais 1956)[6]. On the other hand, Jovanovic's (1982) model predicts

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[6] For a more detailed explanation of Gibrat's law see Sutton (1997).

that, in general, growth is inversely proportional to the age and size of the company. The empirical evidence seems to support Jovanovic's model, as the majority of studies have found a negative relationship between size and age with respect to growth (Evans 1987a, b; Dunne *et al.* 1989; Dunne, Hughes 1994; Audretsch 1995a, b; Harhoff *et al.* 1998; Audretsch *et al.* 1999; Liu *et al.* 1999; Honjo 2004; Yasuda 2004; De Jorge Moreno, Laborda Castillo 2011).

As Lemmon and Zender (2010) point out, although the issue of finance and growth has generated a lot of studies recently, there is still a question pending for future research, as there is as yet no theoretical model that links a company's growth to its finance. Some studies focus on how a firm's growth depends on its financial structure (Hehsmati 2001; Becchetti, Trovato 2002; Honjo, Harada 2006; Mueller 2008)[7] and others in which the financial structure is dependent on the enterprise's growth (Fama, French 2002; Daskalakis, Psillaki 2008), but there have been no studies that address that double causality simultaneously.

But the issue of growth and its implications may affect the variables of our hypothesis, and so, young SMEs, with a high propensity to grow, may have a greater problem of perceived moral hazard in the eyes of financial institutions (Myers 1977), which would reinforce Hypothesis 1. The fact, for example, that a company's growth and its volatility may be related with its growth and size may also strengthen Hypothesis 1, as companies whose cash flows are likely to be more unstable in the near future may find it difficult to finance with debt (Psillaki, Mondello 1996). This would also reinforce Hypothesis 5 about a company's risk, as younger and smaller companies would have higher failure rates (Evans 1987a, b; Mansfield 1962; Hall 1987; Mata 1994; Cressy 1996) and will be riskier (Cressy, Olofson 1997).

3. Sample, classification of firms by age and size, and methodology

3.1. Sample

Our empirical study is carried out by using the SABI[8] database. We included in the final sample all the companies for which there was accounting information for the period 2001–2007. We only tested the hypotheses for 2007. The information relating to previous years was employed for computing some of the variables employed as well as for the additional analyses developed. Information was taken from the balance sheet and earnings statement at the end of the fiscal year and the year when the firm was established. The companies were all limited liability companies and private limited companies not belonging to the financial or insurance industries.

It is relatively usual for information provided by companies to include errors or inconsistencies. To minimize this problem we excluded firms for which there was no-data for

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[7] In the latest years there has been a growing literature of the research line that links corporate growth and financial structure (Fazzari *et al.* 1988; Whited 1992; Rajan, Zingales 1998; Demirgüç-Kunt, Maksimovic 1998; Sarno 2008).

[8] Sistema de Análisis de Balances Ibéricos of the company Informa, S. A. created by Bureau Van Dijk.

three years in a row (as this is necessary for the construction of one of the variables). In addition we also employed the following filters: (1) We eliminated observations for which the variables financial debt, total debt, long-term debt and trade credit scaled by total assets produced values that were not between 0 and 1; (2) we removed observations where the firm had an increase of more than 400% or a decrease of more than the 75% in total assets from the previous year. Following Almeida *et al.* (2004) and Acharya *et al.* (2007), the aim of this filter is to eliminate firm-year observations registering large jumps in their business fundamentals, which typically indicate major and abnormal corporate events; (3) we eliminated those observations showing extreme values for the financing deficit or risk variables[9]; and (4) we removed those firm-year observations reporting negative sales. Finally, we employed an additional filter (5) eliminating observations for which the sum of the disaggregated items of the short-term liabilities was less than 75% of total short-term liabilities (Sánchez-Vidal, Martín-Ugedo 2006), an error probably caused by omissions of some items in the database. The reason for including this filter is that the correct decomposition of the short-term liabilities is important for Hypotheses 2, 3 and 4. This filter substantially reduces the final number of observations in our sample.

After applying all these filters the total number of observations for year 2007 is 5,944.

3.2. Classification of firms by age and size

In order to examine the financial growth cycle hypotheses we have divided the sample into subsamples by age (equal to the number of years since the creation of the enterprise, computed as year of the accounting data minus year of foundation of the firm), and by size.

Berger and Udell classify firms into the following groups: infants (0–2 years), adolescents (3–4 years), middle-aged (5–24 years) and old (25 or more years). Because the first two groups represent a very small percentage of our observations, and because we should not expect very different financing behaviour between infants and adolescents, as the difference in age is very little, we decided to group our age subsamples as follows:
  • young (0–4 years);
  • middle-aged (5–24 years);
  • old (5 or more years).

The European Commission Recommendation (2003) provides four criteria for classifying companies by size. From the four criteria, we have opted for the criterion of total assets, as Aybar Arias *et al.* (2001) find that, when analyzing the capital structure of firms, the figure of total assets and the consideration of more than one criterion simultaneously are the best options for the size variable. In concrete terms, and following the European Commission report, we have divided the sample into:
  • small (less than €10 million of total assets);
  • medium-sized (between €10 million and € 43 million of total assets).

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[9] We eliminated outliers that were above and below 3 times the standard deviation from the mean (Hair *et al.* 1999).

We use only SMEs and exclude large firms because the financial growth cycle is thought to be especially important for medium and small companies. In Table 1 we show descriptive statistics of our sample. In Panel A it can be seen that the highest proportion of companies are middle-aged, followed by old firms. In Panel B it can be seen that there are nearly equal proportions of medium and small sized companies, although there are slightly more small ones. Finally, the cross tabulated information presented in Panel C suggests a positive correlation between age and size, as older companies tend to be larger and vice-versa.

Table 1. Descriptive statistics

Panel A: Breakdown by age	Young	Middle-aged	Old	Total
Number of observations	218	4,152	1,574	5,944
% of the sample	3.668%	69.852%	26.480%	100.000%
Mean of age (years)	3.32	15.44	36.22	

Panel B: Breakdown by size	Small	Medium	Total
Number of observations	3,311	2,633	5,944
% of the sample	55.703%	44.297%	100.000%
Mean of size (total assets thousands €)	4,661.535	14,792.862	

Panel C: Cross-tabulated information of subsamples by age and size

	Young		Middle-aged		Old		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Small	137	2.305%	2,430	40.882%	744	12.517%	3,311	55.703%
Medium	81	1.363%	1,722	28.970%	830	13.964%	2,633	44.297%
Total	218	3.668%	4,152	69.852%	1,574	26.480%	5,944	100.000%

3.3. Methodology

Tests are carried out through one or two factor MANOVAs. A MANOVA is similar to an ANOVA. An ANOVA test is equivalent to a t-test of the difference of means, but is used because the dependent variable is a continuous variable while the independent variable is categorical with more than two categories (as for example three age groups). In the ANOVA, an F test serves to test the null hypothesis that the means of the dependent variable for the groups (subsamples of the dependent variable computed using the categories of the independent variable) are not different. The higher the F value, the lower the probability of accepting the null hypothesis. When considering the effect of more than one factor, the analysis is called multivariate ANOVA or MANOVA.

The MANOVA test is more appropriate for the case in which there are two or more dependent variables. It is more robust and statistically more powerful than the ANOVA, as it controls for the potential correlation among the dependent variables. In our case,

it is the most appropriate test to contrast the overall significance tests for the influence of the two factors, since most of our dependent variables show significant correlations when applying the Pearson correlation test (results not presented).

The MANOVA tests need the variables in the sample to satisfy some statistical criteria: independence, multivariate normality and homoscedasticity. After confirming, through the appropriate tests, that these criteria are not satisfied, we proceeded to randomly balance all the sample groups, as can be seen in Table 2. By proceeding in this way, the fact that the criteria for applying MANOVA were not initially satisfied does not significantly affect the validity of the results (Uriel 1995)[10] as our subsamples are now balanced and still large enough. We also show, in Appendix 2, the industry composition of the complete and the balanced samples, in order to check the stability of the composition of the selected sector of the sample once it is balanced. As can be seen from the Appendix, the composition is similar.

Table 2. Balanced sample

	Young	Middle-Aged	Old	Total
Young	81	81	81	243
Medium	81	81	81	243
Total	162	162	162	486

In spite of the fact that panel data were available, the reason for not working with more than one year is that we wished to avoid a situation where observations for the same company were repeated in the same group, or where they were compared when a company moved from one group to another. By restricting observations to a single year, we eliminate the bias that could arise from the fact that there may be an individual company effect that we have not taken into account, or from the absence of independence of the cases.

This analysis was conducted using the SPSS statistical software package. In the results section we first present the Wilks' Lambda and the Hotelling's Trace[11] tests for the dependent variables, which indicate the overall significance of each of the factors, as they test the null hypothesis that each effect is not significant for any of the dependent variables, that will indicate whether analyzing the two factors jointly makes sense or not.

We also present the overall F for each main factor, which tests the null hypothesis that there is no difference in the means of each dependent variable for the different groups formed by categories of the independent variables. Individual Fs which test the influence

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[10] All the analysis conducted in the Results section has been repeated for the whole sample (i.e. for the 5,944 cases). It is important to note that the results obtained for the whole sample are similar to those for the balanced sample.

[11] It is generally recommended that, when using MANOVA, two multivariate significance tests are run (Bray, Maxwell 1985). Although both analyses test the same thing, the Wilks' lambda is generally preferred when the factors have more than two categories.

of each factor on each dependent variable are also shown. Where the individual F is not significant, it would be more appropriate to study the influence of each variable using MANOVA for one factor (age and/or size when significant). Using one factor MANOVA for the case in which the interaction factor was significant would not be correct as it could happen that, even though the main effect was not significant, it nevertheless had significance for each of the single factor groups when taking into account the levels of the other independent variable. The significance of the individual factors and of the interaction factor will indicate the probability of making a type I error (that is, indicating that the factor is significant when it is not).

The observed power, calculated with an $\alpha = 5\%$, that indicates the probability of making a type II error (that is, indicating that the relationship is not significant when it actually is) is also shown. The partial eta-squared (η^2) is the proportion of the total variability of the dependent variable explained by the variation of the independent variable, and thus, it is a measure of the relative force of each factor. The significance of the pairwise comparisons test shows whether we can consider differences between the dependent variable for the groups formed according to the categories of one factor taken two by two, measured according to the test of Tukey or the test of Games-Howell. The latter test is more appropriate when the variances are not homogeneous. When the variances are homogeneous the Tukey method is optimal when the groups have the same number of observations, as in this case. For the one factor MANOVA of size, the comparison is made through a simple difference of means t-test, as there are only two groups[12].

4. Results

The results of the two factor MANOVA are presented in Table 3. We also show the figures for the estimated marginal means (Figures 1 to 8) to illustrate the explanations. Panel A of Table 3 shows the results of the two overall significance tests. In Panels B and C the means of the dependent variable depending on the two factors, as well as the statistical significance tests, are shown. Finally, Panel D and Panel E show the results of the one factor MANOVA for the variables for which there is no significant interaction factor and the respective factor is significant.

In Panel A of Table 3 we can see that the two overall significance tests are significant at the 1% level. Both tests and the partial η^2 indicate that age is more important than size for creating more homogeneous groups of our dependent variables. The interaction factor is not significant, indicating that each factor plays a separate role when influencing the variables of our study. In an analogous study and with similar methodology López-Gracia and Aybar-Arias (2000) find that size and industry play a role in the financing policy of companies. As the factors condition firms' capital structures we can conclude, as indicated by Gregory *et al.* (2005), that enterprises have different capital structures depending on age and size.

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[12] The Tukey, the Games-Howell and the difference of means tests compute the significance of the difference of each category of that factor compared to the other category/ies, leaving only one category of the factor that is not being analysed.

Table 3. Multivariate analysis of variance (MANOVA)

Panel A: MANOVA of the age, size and age-size interaction factors

	Age	Size	Interaction factor AgexSize
Hotelling's Trace	9.425***	4.349***	0.855
Wilks' lambda	9.183***	4.349***	0.855
Partial η^2	0.104	0.052	0.011

Panel B: Means of each dependent variable for the categories of each factor, overall and individual Fs, observed power and partial η^2 for the two factor MANOVA for the equity, trade credit, relative trade credit, relative short term financial debt, financing deficit and risk variables. The pairwise comparison of every pair of the category groups are also shown

		Means for the size groups		Overall F	Individual Fs of each factor		Observed Power	Partial η^2	Pairwise comparisons (significance)					
		Small	Medium							Sm	Me	1	2	3
Equity	1 – Young	0.219	0.213	16.761 ***	Age	41.647 ***	1.000	0.148	1–2	***	***			
	2 – Mid-aged	0.315	0.336		Size	0.052	0.056	0.000	1–3	***	***	Sm-Me		
	3 – Old	0.422	0.419		AgexSize	0.229	0.086	0.001	2–3	***	**		**	
Trade credit	1 – Young	0.337	0.339	7.813 ***	Age	16.135 ***	1.000	0.063	1–2		***			
	2 – Mid-aged	0.303	0.235		Size	3.649 *	0.479	0.008	1–3	***	***	Sm-Me		**
	3 – Old	0.239	0.211		AgexSize	1.573	0.334	0.007	2–3	**				
Rel. trade credit	1 – Young	0.432	0.422	2.257 **	Age	0.733	0.174	0.003	1–2					
	2 – Mid-aged	0.445	0.349		Size	6.887 ***	0.745	0.014	1–3			Sm-Me	***	*
	3 – Old	0.437	0.380		AgexSize	1.466	0.313	0.006	2–3					

Continue of Table 3

Panel B (*Continued*)

Variable	Group	Means for the size groups – Small	Medium	Overall F	Individual Fs – factor	Individual Fs value	Observed Power	Partial η²	Pairwise pair	Sm	Me	Sm-Me (1 2 3)
Rel. ST Fin Debt	1 – Young	0.644	0.594		Age	3.747 **	0.684	0.015	1-2		**	
	2 – Mid-aged	0.580	0.466	5.126 ***	Size	14.767 ***	0.970	0.030	1-3			Sm-Me 2: ** 3: ***
	3 – Old	0.693	0.507		AgexSize	1.685	0.355	0.007	2-3	*		
Financing deficit	1 – Young	0.008	0.007		Age	2.663 *	0.528	0.011	1-2			
	2 – Mid-aged	−0.031	−0.007	1.431 ***	Size	0.832	0.149	0.002	1-3			Sm-Me
	3 – Old	−0.021	−0.014		AgexSize	0.499	0.132	0.002	2-3			
Risk	1 – Young	0.521	0.779		Age	6.501 ***	0.906	0.026	1-2		**	
	2 – Mid-aged	0.362	0.349	3.606 **	Size	2.605	0.364	0.005	1-3	**		Sm-Me 1: *
	3 – Old	0.358	0.458		AgexSize	1.212	0.265	0.005	2-3			

Panel C: Same statistics as Panel B for the variables resulting from the decomposition of equity: external equity and retained earnings

Variable	Group	Means for the size groups – Small	Medium	Overall F	Individual Fs – factor	Individual Fs value	Observed Power	Partial η²	Pairwise pair	Sm	Me	Sm-Me (1 2 3)
External equity	1 – Young	0.094	0.126		Age	8.496 ***	0.966	0.034	1-2	**		
	2 – Mid-aged	0.055	0.086	4.720 ***	Size	5.719 ***	0.665	0.012	1-3	**	***	Sm-Me 1: *
	3 – Old	0.057	0.068		AgexSize	0.445	0.122	0.002	2-3	***	***	
Retained earnings	1 – Young	0.118	0.082		Age	63.374 ***	1.000	0.209	1-2	***	***	
	2 – Mid-aged	0.260	0.256	25.620 ***	Size	0.823	0.148	0.002	1-3	***	***	Sm-Me
	3 – Old	0.366	0.355		AgexSize	0.265	0.092	0.001	2-3	***	**	

End of Table 3

Panel D: MANOVA of the Age factor for the equity, trade credit, relative short term financial debt, financing deficit and risk variables

Variables	Means for the age groups			Levene's test	F of the Age effect		Observed potency	Partial η²	Pairwise compar. (signif)		
	Young	Middle-aged	Old						1–2	1–3	2–3
Equity	0.216	0.326	0.421	2.159	41.863	***	1.000	0.148	***	***	***
Trade credit	0.338	0.269	0.225	23.833 ***	16.009	***	1.000	0.062	***	***	**
Relat ST fin debt	0.619	0.522	0.600	0.265	3.633	**	0.670	0.015	**		
Financing deficit	0.013	−0.019	−0.017	10.816 ***	3.109	**	0.598	0.013			
Risk	0.650	0.356	0.408	3.862 **	6.473	***	0.905	0.026	***	**	

Panel E: MANOVA of the Size factor for the trade credit, relative trade credit and relative short term financial debt variables

Variables	Means for the age groups		Levene's test	F of the Age effect		Observed potency	Partial η²	Subsamples compar. (signif)
	Small	Medium						Sm–Me
Trade credit	0.293	0.262	0.394	3.426	*	0.455	0,007	**
Rel trade credit	0.438	0.384	0.393	6.882	***	0.745	0,014	***
Rel ST finan debt	0.639	0.522	0.916	14.561	***	0.968	0,029	***

Notes: In Panel A we present two overall significance tests for each factor: the Hotelling T-square and the Wilks's lambda, along with the partial η². In Panel B we show the means of each dependent variable for the categories of each factor are shown, along with the overall F, the individual F of each factor on each dependent, the observed power, the partial η² and the significance of the pairwise comparison of two of the category groups of one factor for each of the category of the other factor (represented in the column). We show the significance of the Tukey or the Games-Howell tests depending on the homogeneity or not of the groups' variances. 1 = Young, 2 = middle-aged and 3 = old. Sm = small and Me = Medium Panel D presents the MANOVA of the Age factor for the equity, trade credit, relative short term financial debt, financing deficit and risk variables. Levene's test contrast the equality of variances. We show the significance of the Tukey or the Games-Howell tests depending on the homogeneity or not of the groups' variances. In Panel E in the subsamples comparison we show the significance of the difference of means t-test. *, **, ***Significant at 0.10, 0.05 and 0.01 level, respectively

Hypothesis 1

Panel B shows the marginal means for the dependent variable depending on the two factors, the overall F of each factor for each dependent variable, the individual Fs and the interaction factor significance test. We find that equity is influenced by age, but not by size or the interaction between age and size. Therefore it is more appropriate to comment the MANOVA on the basis of the results of the one factor analysis shown in Panel D. We confirm that Hypothesis 1 is not satisfied, as equity does not decrease with age, but, on the contrary, increases. There are differences in the pairwise comparisons for all the age groups. This evidence is similar to what found by Berger and Udell (1998), although the difference of approximately 20 percentage points between our young and old companies indicates an even larger effect, compared to the approximately 8.5 percentage points that they found. This difference may be due to the relative underdevelopment of the angel finance and venture capital markets in Spain.

Because age is shown to be very important, in terms of both its F and its partial η^2 values, and because our null hypothesis is rejected in such a clear way, we consider it important to examine these results more deeply, by disaggregating the equity variable into what we have called external equity (shareholders' equity not generated inside the company, coming from equity issues) and retained earnings (Panel C of Table 3[13] and Figures 2 and 3).

We find in Panel C that retained earnings is the variable more affected by the age factor, as can be deduced from the individual F, which is larger than the other F values in Panels B and C. This high significance is crucial in explaining the equity variable pattern. Retained earnings condition equity and, indirectly, the company's whole capital structure, in such an important way that we are compelled to reformulate Hypothesis 2 to take into account the decrease in total debt with age. In Figure 3 and Panel C we can see that retained earnings increase with age for the two size subsamples. This evidence agrees with the arguments put forward by Michaelas *et al.* (1999), who state that retained earnings will increase if a company follows a pecking order when seeking finance (Donaldson 1961; Myers, Majluf 1984), as the older the company is, the higher the probability of having retained income. The availability of retained earnings can be a key factor for companies in the execution of their growth plans (Faulkender, Petersen 2006). This would reinforce the arguments of Michaelas *et al.* (1999) with respect to the results for Hypothesis 1. It seems that, as Saksonova (2006) argues, companies that are profitable (which are the ones that are more likely to survive many years) do not use the potential to borrow capital. Even if their image in capital markets may be good, this borrowing potential remains unused, as companies prefer to retain earnings in their own company, which will probably have high returns on capital. This relatively

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[13] To obtain these results we have computed the two factor MANOVA for these two variables together with the other dependent variables, with the exception of the equity variable, to avoid perfect multicolinearity. Although for the equity variable size is not significant, we have entered this factor again for the external equity and retained earnings variable to leave opened the possibility that these variables may be significantly affected by size.

high retention of earnings may be driven by the presence of a more severe finance gap problem for SMEs in non-Anglo-Saxon countries (Holmes, Kent 1991). In fact, La Porta *et al.* (2000) report that lower dividends (and so higher retentions, for a given profitability) are paid by corporations in Civil Law countries as opposed to the Common Law countries.

Figure 2 shows that there is a tendency towards a moderate increase in external capital with respect to size, although it is only significant for the middle-aged companies. There is a statistically significant drop in external equity with respect to age, when young firms are compared with middle-aged and old companies. This fall may be due to a dilution effect, because as time goes by, the company may be financed with relatively more debt and retained earnings. This result is similar to what found by Gregory *et al.* (2005), who observe that younger companies are more prone to finance with external equity. The decrease of external equity with respect to age does not cancel out the increase in retained earnings, which drives the behaviour of the equity variable. It seems that the moderate increase in external equity with size offsets the slight decrease of retained earnings with respect to the same factor, which makes the sum of the two, or total equity, not dependent on size.

All this evidence is consistent with the results of Petersen and Rajan (1994, 1995), Michaelas *et al.* (1999) and Hall *et al.* (2000), who observe that age negatively influences debt, and with the results of Fluck *et al.* (1998), who find that the proportion of internally-generated equity increases with age for young firms. For such firms, internal resources (from the entrepreneur or his or her family) are fundamental for
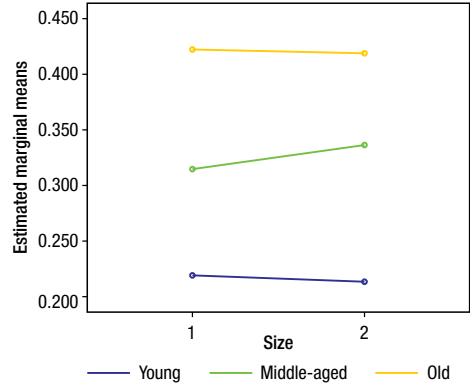
Fig. 1. EQUITY Variable
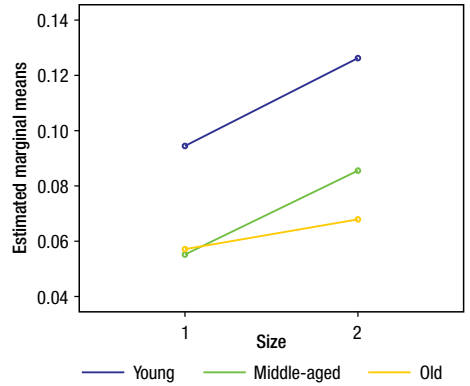
Fig. 2. EXTERNAL EQUITY Variable
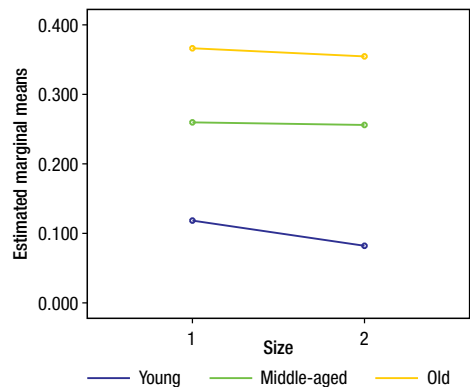
Fig. 3. RETAINED EARNINGS Variable

growth. La Rocca *et al.* (2011) also found that young firms are more dependent on debt. They argue that this is explained by the fact that most of the loans are personally guaranteed. We can conclude with respect to the equity hypothesis that size is not significant and that the age factor plays a role that is contrary to what was expected from the financial growth cycle.

Hypothesis 2

We have calculated the one factor MANOVA for the trade credit variable for the two factors (as the interaction factor is not significant), even though the size factor is only significant at the 10% level. Figure 4 and Panel D indicate that younger companies tend to use more of this type of financing and that there are differences for all the age groups. The evidence with respect to size is that smaller companies tend to use this type of debt more, too.

Equity (and consequently total debt) does not remain constant, as already noted, and so, it may be adequate to repeat the analysis using the relative trade credit variable (trade credit divided by total debt). Results for this variable are similar to those for the relative credit variable, although the age factor is now not significant and size is shown to be more important. Panel E and Figure 5 indicate that medium-sized companies tend to use this type of debt less, and this confirms Hypothesis 2.
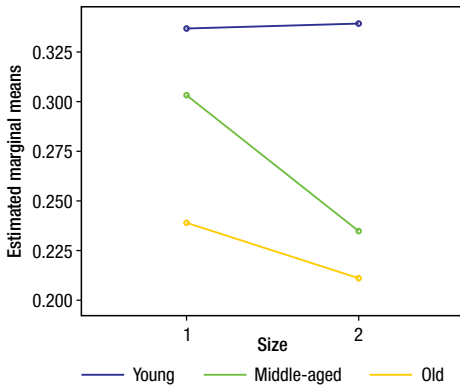
Fig. 4. TRADE CREDIT Variable   **Fig. 5.** RELATIVE TRADE CREDIT Variable
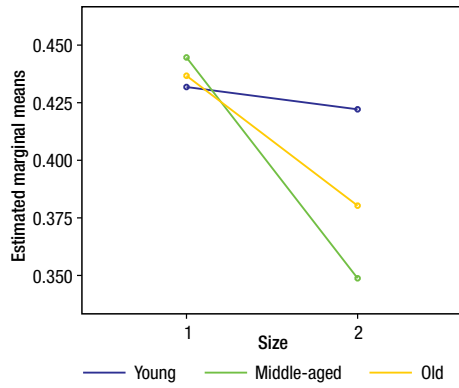
This evidence with respect to the trade credit and the relative trade credit variables is similar to the results of Sarno (2008) for a sample of Italian SMEs and also those of Hughes (1997), who finds that a smaller proportion of finance is provided for larger companies by trade creditors.

We can conclude that Hypothesis 2a is confirmed for both factors and that Hypothesis 2b is confirmed for the size factor. Younger and smaller companies tend to use more trade credit than older and larger firms, and smaller companies use more trade credit as a proportion of their total debt.

Hypothesis 3

Relative short term financial debt variable results are shown in Panel B and indicate that both age and size are significant, but not the interaction factor. The values in Panel D and E and Figure 6 are compatible with the financial growth cycle for the age and size factor, as both the individual Fs and the differences between groups are significant. There seems to be an increase in this type of financial debt when passing from middle-aged to old companies but the differences between groups are not statistically significant (Panel D).

The evidence with respect to size is similar to the results of Hughes (1997), Sarno (2008) and Mac an Bhaird and Lucy (2010), who find that the use of long-term debt financing is positively related to the size of the firm. Size is the more important factor for this variable, as can be seen from the difference in the values of the means, the individual F tests and the significance of the pairwise comparisons in Panels D and E.

Hypothesis 4

The one-factor MANOVA of the financing deficit variable was conducted, even though the age factor is only significant at the 10% level. Panel D indicates that although age is significant at the 95% level, and it seems that there is a decrease in the financing deficit with age, at least when comparing young companies with the middle aged and old companies, as can be seen in Figure 7. The pairwise comparisons are not significant, which suggests that the conclusions drawn from this hypothesis are weak.

We investigated this departure from the logic of the financial growth cycle further, to try to explain why this hypothesis is not supported. From a theoretical point of view, the financing deficit should be influenced by the stage in the company's life cycle. The life cycle model suggests that companies pass through different phases depending on their product cycle: birth, growth, maturity and revival or decline[14]. The diverse phases the companies go through influence the different policies the companies implement, and the characteristics that define them: risk, investments, profitability, and so on. According to
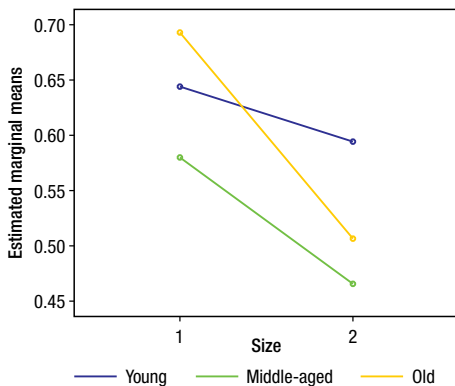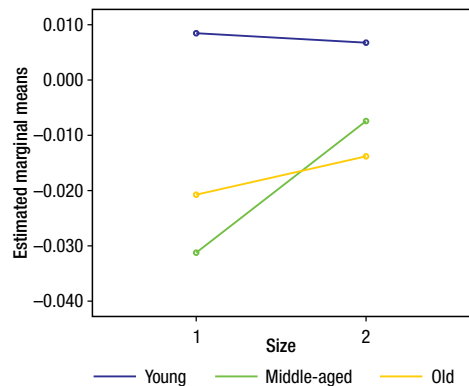

Fig. 6. RELAT ST FIN DEBT Variable

Fig. 7. FINANCING DEFICIT Variable

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[14] For a detailed explanation see Miller and Friesen (1984).

this theory, as companies grow older, investments decrease and profitability rises. As a result, their financing deficit should decline.

After disaggregating the financing deficit into its major components[15], we found that investments decrease with age (7.6; 7.4 and 6.9), dividends paid increase (0.5; 1.0 and 1.2) and cash flows increase (8.2; 10.0 and 10.2). Consequently, the financing deficit decreases as the cash flows rise and its variation is proportionally more important. With respect to size, investments increase (6.3 and 8.2), dividends paid decrease slightly (0.9 and 0.86) and cash flows decrease (9.6 and 9.3), so that the rise of investments is proportionally more important, but not enough to make the two groups statistically different, and the individual F of the size factor is significant only at the 10% level.

The lack of confirmation of this hypothesis with respect to the age factor and the non significance of the size factor might be different if the main capital markets in Spain were as developed as they are in the countries belonging to the Anglo-Saxon financial system. Seifert and Gonenc (2008) find an average value for the financing deficit variable, computed in the same way as we do, of 0.111 for a sample of American companies, which is clearly higher than the values for our sample companies, indicating poor access to external financing in Spain. Beck *et al.* (2008) find that small firms and firms in countries with less developed market and financial systems use less external finance, especially bank finance, which means lower financing deficits.

Hypothesis 5

Our risk variable, using the EBITDA's variation coefficient as a proxy, shows that size is not important and thus Hypothesis 5 with respect to size is not confirmed. Age exerts the expected influence, because risk diminishes with age, as young firms show a more volatile EBITDA (as can be seen in Figure 8) and the comparison with middle-aged and old companies is statistically signi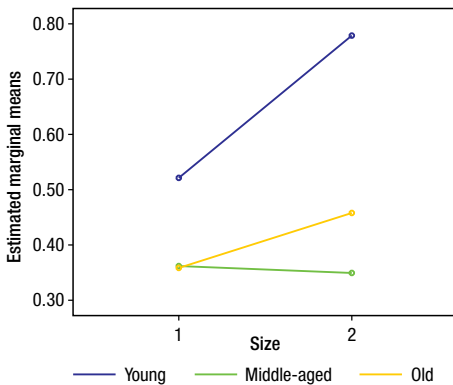ficant. This means that Hypothesis 5 with respect to age is confirmed and is in line with the "noisy selection" proposed by Jovanovic (1982). Size is not significant and this may be due to the fact that medium sized companies may still not have reached a size that allows them to be considered 'diversified'.

Additional analyses

In addition to the previous tests, we also conducted other analyses, and we have repeated the tests for the first year of our sample for which there are figures for all the variables, 2003[16]. The aim is to check whether the evidence was similar even

Fig. 8. EBITDA's VAR COEFF Variable

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[15] We do not comment the fourth component, increase of working capital, as it proportionately less important than the other three components.

[16] This sample has also been balanced, as in year 2007.

though the results come from different periods. In this way, we can take into account the fact that macroeconomic characteristics (for example, interest rates, different phases of the economic cycle, and so on) could influence results. When analysing the figures and the MANOVAs for the earlier year, we find results that are similar to those of 2007 (results not reported), except for trade credit, and relatively short-term financial debt, which exhibit behaviour that is less in accordance with the financial growth cycle for the age factor.

As well as controlling the industry composition of the balanced sample, we also wanted to study the industry influence in a more explicit way, because, as Galbraith (1983) points out, the industry may be the factor that dominates a company's performance and policy. We have repeated the former analyses but calculating the variables as industry-adjusted variables, that is, computing the variables as a difference between the variable value and the industry-year mean value for that variable[17] (results not reported). Results are again very similar, and we therefore conclude, like Gregory *et al.* (2005), that industry is not a determinant factor in the results.

5. Conclusions

This study tests whether the implications of the financial growth cycle hold for a sample of Spanish SMEs. This paper contributes to the growing number of country-specific studies on the determinants of capital structure and the financial growth cycle in SMEs by providing original empirical evidence from the Spanish context.

We have examined diverse hypotheses employing MANOVA analyses for a sample of Spanish SMEs. The results obtained show that age exerts the expected influence on the use of trade credit, relative short term financial debt and the risk variables, but has the opposite effect to what expected on equity and the financing deficit. Size exerts the anticipated influence on trade credit, relative trade credit and relative short term financial debt and has no significant effect on equity, financing deficit and risk. Although, in general, the effects of this factor have lower overall significance, and can therefore be seen as not being as important as age, in none of the five hypotheses are the results contrary to what was expected.

Equity is found to increase with age, a result driven by the remarkable increase of the retained earnings as companies get older. Size is found not to influence the equity variable.

With respect to trade credit, both age and size behave as predicted by the financial growth cycle model. Taking into account the fall in total debt by computing the relative trade credit variable, we find that age is now not significant and size continues to exert the same influence as it exerts on the trade credit variable. The use of more long-term financial debt by older and larger companies is confirmed too. The financing deficit does not seem to be influenced by size and there seems to be something of a departure from

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[17] The industry adjusted variables are obtained using industry definitions at the two digit NACE level.

what was expected with respect to age. This result is caused by the fall in investments and the rise of cash flows with age, which reduces the need for external funds. This behaviour may be explained by the life cycle theory, according to which companies pass through different phases for a product or the company as a whole, and implies that, in the mature phases, investments diminish and the company is more profitable.

The results with respect to risk depict a situation in which time makes companies less risky, as predicted by the financial growth cycle and coinciding with Jovanovic's arguments. Size is found not to influence company risk. Our results also indicate that financial growth cycles are generally not determined by macroeconomic factors and that the industry does not play an influential role either.

We can conclude that the financial growth cycle offers some valuable insights and holds for the sample of small and medium Spanish enterprises analysed, with one notable exception: equity does not diminish with age. In fact, the first hypothesis is powerfully rejected, as the equity results show an overall F which seems to be completely driven by the age factor F (and which is also the highest value for any individual factor in any of the hypotheses). This could also be behind the fact that the age factor seems more important than the size factor for the overall significance test, taking all the dependent variables as a whole. This failure to conform to the financial growth cycle model is mainly driven by a pecking order behaviour, as companies tend to finance their investments with retained earnings. This means that equity increases remarkably in the older companies' capital structures and also causes the financing deficits to decrease at the same time as investments decrease and companies use their increased cash flows to invest. This would be a second failure of the life cycle model, but it is not so important, as it is only significant for the age factor and not in a powerful way, since the pairwise comparisons were not statistically significant.

The remarkable increase of equity with age, which in turn causes a decrease of the total debt, would indicate the need to include the age variable when analyzing the leverage of companies in any capital structure study.

The results also highlight the fact that a Civil Law country like Spain may have a different financial growth cycle, characterised by a more pronounced pecking order behaviour, which results in heavy earnings retention and lower financing deficits. The evidence also shows that Spanish companies are highly indebted in their early stages, but then become quite dependent on retained earnings to grow and survive. As is typical of Civil Law countries, the angel and venture capital markets are poorly developed, and consequently policymakers should support entrepreneurship and the establishment of new firms by fostering the development of these markets if they wish to promote job creation.

Acknowledgement

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APPENDIX 1

Berger and Udell's (1998) Financial Growth Cycle
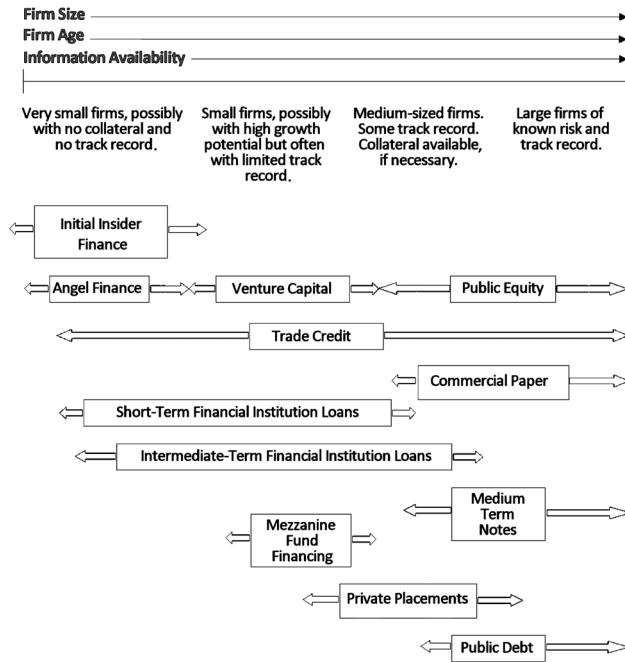
APPENDIX 2

Distribution of companies by industry

	Whole sample	Balanced sample
Agriculture, forestry and fishing	0.96%	1.03%
Mining and quarrying	0.84%	0.82%
Manufacturing	30.01%	30.66%
Electricity, gas, steam and air conditioning supply	0.30%	0.21%
Water supply, sewerage, waste Management and remediation activities	0.59%	0.62%
Construction	11.07%	10.91%
Wholesale and retail trade: repair of motor vehicles and motorcycles	36.79%	36.01%
Trasportation and storage	5.85%	6.58%
Accommodation and food service activities	2.36%	1.44%
Information and communication	2.62%	2.88%
Real estate activities	0.03%	0.21%
Professional scientific and technical activities	0.49%	0.62%
Others	4.02%	5.35%
TOTAL	100.00%	100.00%

Javier SÁNCHEZ-VIDAL is Master Degree in Money, Banking and Finance from the Sheffield University Management School, and Ph.D. in Economics and Business from the Universidad Politécnica de Cartagena. At present he is Assistant Professor of Financial Economics at the Faculty of Business Studies at the Universidad Politécnica de Cartagena. His main research topics are related to corporate finance, cash holdings and econometrics.

Juan Francisco MARTÍN-UGEDO is Diploma of Advanced European Studies from the College of Europe in Brugge and Ph.D. in Business Administration from the University of Murcia. At present he is Associate Professor of Corporate Finance and Associate-Dean (International Relations) at the same university. His main research topics are related to corporate finance and corporate governance.