SUPPLIERS FINANCING AND EARNINGS QUALITY

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Abstract

In this paper we investigate the effect of earnings quality on supplier credit in a sample of small and medium sized firms. After controlling for other determinants of trade credit, we show that firms whose earnings present lower variability, higher smoothing and predictability, and higher accruals quality have access to more trade credit from suppliers. This association suggests that earnings attributes associated to lower volatility and higher precision with respect to cash flows facilitate access to trade credit.

Keywords: Earnings quality, earnings variability, smoothness, accruals quality, earnings predictability, suppliers financing, trade credit.

JEL classification: G3, G32.

1. INTRODUCTION

In code law countries with banking oriented financial systems, banks and suppliers are the main sources of external financing for firms, especially SMEs, and previous studies on trade credit have shown that information asymmetry is a relevant factor in determining supplier financing (Petersen and Rajan, 1997; Scherr and Hulburt, 2001; Niskanen and Niskanen, 2006).

Research has shown that, in a context of information asymmetry and agency conflicts, firms can reduce adverse selection and moral hazard problems through financial reporting quality (Healy and Palepu, 2001), and there is also a relevant field of research that has provided empirical evidence that higher financial reporting quality has important economic consequences in capital and debt markets (Francis, Lafond, Olsson and Schipper, 2004 and 2005; Bharath, Sunder and Sunder, 2008; Hasan, Park and Wu, 2012). Since higher financial reporting quality reduces the risk of information about the firm and influences the estimates of future cash flows, lenders and capital providers can demand a lower cost of capital and debt and less stringent contract terms, such as longer maturity of loans and fewer collateral requirements. Although the main focus of research on earnings quality has been primarily capital markets, recent papers study how accounting information affects private debt contracts (Bharath et al., 2008; Ball, Bushman and Vasvari, 2008; Hasan et al., 2012).

In this paper we consider several attributes of earnings quality and investigate whether they affect access to supplier financing in SMEs. So, our study focuses on private firms and the effect of earnings attributes on private lenders other than banks, i.e., suppliers, which, together with banks, are the main providers of financing for SMEs in code law countries. There are several arguments that support that earnings quality may influence supplier financing. First, according to previous studies on the economic

consequences of earnings quality, if higher earnings quality reduces information risk, providers of funds can estimate the future performance of a firm better. Second, less volatile earnings also diminish the perception of firm risk, and so positively affect firm valuation and the trade terms with its stakeholders (Trueman and Titman, 1988). According to the Graham, Harvey and Rajgopal (2005) survey on 401 U.S. CFOs, managers believe that a smooth earnings path is perceived as less risky by investors (89%), which makes it easier for investors to predict future earnings (80%) and assures customers and suppliers that the business is stable, which probably implies better terms of trade (66%). Notwithstanding the different context of the Graham et al. (2005) study, mainly focused on public U.S. firms, and ours, the preference for a smooth path of earnings has also been documented for private firms (Burgstahler, Hail, and Leuz, 2006), since Burgstahler et al. (2006) find higher smoothing in private firms than in public firms in within country analyses. Therefore, we test whether firms with less volatile and more predictable earnings, and also with lower information risk, can access more trade credit from suppliers.

We consider different attributes of earnings based on accounting information and related to the usefulness of future-oriented decisions (Francis et al., 2004; Dechow, Ge, and Schrand, 2010): i) accruals quality, which focuses on the precision of earnings with respect to cash flows and, according to Francis et al. (2004), is the attribute of earnings that is most associated with the reduction of information risk; ii) earnings variability before smoothness, which refers to the volatility of earnings; iii) earnings smoothness, which relates the volatility of earnings to the volatility of cash flows, and iv) earnings predictability, which refers to the ability of earnings in t-1 to predict earnings in t. The last three are all attributes that reflect the stability of earnings, although in the case of earnings smoothing there is a debate in the literature, as shown

by Dechow et al. (2010), as to whether it is a valuable attribute of earnings that reduces information asymmetry by improving earnings informativeness (Francis, Olsson and Schipper, 2008), or, on the contrary, it is an opportunistic choice of managers to report less volatile earnings. Nevertheless, since smooth earnings eliminate uncertainty about earnings, even under this consideration the firm could benefit from more trade credit from its suppliers if they associate income stability with lower risk and more stable business.

We use a sample of Spanish small and medium sized firms (SMEs), which provides a good environment for the purpose of this research. SMEs are likely to suffer severe problems of asymmetric information, owing to their size and background and the lack of formal credit rating measures for firms. Moreover, trade credit is especially important for SMEs because of their greater difficulty in accessing capital markets (Petersen and Rajan, 1997; Berger and Udell, 1998, Fisman and Love, 2003), so suppliers become one of the main providers of financing sources for these types of firms. Trade credit in the Spanish financial market is also particularly important for several reasons: First, in contrast to the well-developed capital markets in the U.S. or U.K., the financial system of continental European countries, and in particular Spain, is banking oriented (Schmidt and Tyrell, 1997) where most resources are channelled through financial intermediaries and suppliers (Demirgüc-Kunt and Maksimovic 2002). Besides, Spain is a French civil law country where protection of creditors is not high (La Porta, López de Silanes, Shleifer and Vishny, 1997; La Porta, López de Silanes, Shleifer and Vishny, 1998), and this increases the importance of trade credit in comparison with bank credit (Burkart and Ellingsen, 2004). Actually, Spanish firms present one of the highest levels of trade credit in Europe, after Italy (Marotta, 2001), mainly due to the fact that initial terms of payment are longer in Mediterranean

countries (García-Teruel and Martínez-Solano, 2010). In addition, the average size of Spanish SMEs is smaller than in the wealthier northern European countries (Mulhern, 1995), indicating the existence of higher levels of asymmetric information between firms and suppliers, although Spanish SMEs firms are integrated in a market where creditors' rights are not high (2 points out of 4, according to La Porta et al. 1998 index). This favours the interest of suppliers in evaluating the financial capacity of customers, so the quality of accounting information could be considered an important issue.

Our results show that, after controlling for other determinants of trade credit and innate determinants of earnings quality, firms with higher accruals quality, smoothing and predictability, have access to more trade credit from suppliers. These results have important implications for financing in the Spanish financial market because of the high dependence on suppliers presented by SMEs Spanish firms. Hence, these firms might alleviate their credit constraints with more accurate, predictable and stable earnings, which would enable better access to trade credit. Moreover, this improvement of trade credit received could also act as a positive signal to credit institutions about the borrower's creditworthiness (Biais and Gollier, 1997). The results may also be of interest for other countries where SME firms are important and where banks and suppliers constitute their main sources of financing.

The paper proceeds as follows: in the second section we present the literature on the determinants of trade credit from suppliers and discuss the hypotheses to be tested. In the third section we describe the institutional setting of our sample. The fourth section describes the model specification, and the sample and data used are presented in section five. In section six, our results are discussed, and concluding comments are offered in the final section.

2. PREVIOUS LITERATURE

In recent years trade credit literature has established the importance of credit quality and asymmetric information between buyers and sellers in determining trade credit (Smith, 1987). From the buyers' perspective, customers do not know the characteristics and quality of products, and trade credit allows them to verify that merchandise received complies with the agreed terms -quantity, quality, etc. - (Lee and Stowe, 1993; Long, Malitz and Ravid, 1993; Deloof and Jegers, 1996; Pike, Cheng, Cravens and Lamminmaki, 2005). From the sellers' perspective, suppliers do not discern the real creditworthiness of buyers and face moral hazard problems due to the possibility of their clients not paying by the date established and, as a consequence, they generate bad debts. Thus, firms granting trade credit face late payment and default risk. With the purpose of reducing uncertainty about payment intention, suppliers may establish a wide variety of payment terms: cash-on-delivery or cash-before-delivery, net payment terms, and two-part payment terms (Wilson and Summers, 2002).

When suppliers offer a customer cash-on-delivery or cash-before-delivery payment terms, there is no trade credit, and firms may lose sales. Pike et al. (2005) show that these terms are strongly associated with smaller suppliers, since they present lower financial viability and late payment or default might cause them financial problems. Firms may also offer "net terms", or "one-part" terms, where payment should be made after an agreed specific period of time. In this case, suppliers do not offer any discount for early payment. Finally, two-part payment terms can be offered by sellers to their buyers with the intention of providing incentives for early payment. In this case, suppliers offer two payment possibilities: 1) to pay in a short period of time after delivering merchandises, with a discount on the agreed price; 2) to pay at the end of the credit period, as in net terms. In general one-part terms involve free financing for buyer

while the lost discount in two-part terms represents the cost of financing for the net period. The most usual trade credit conditions are on "net terms" (Willson and Summers, 2002; Giannetti, Burkart and Ellingsen, 2011), and discount for early payment tends to be offered to riskier customers (Klapper, Laeven and Rajan, 2012). Also, in the case of Spanish firms, the most common credit terms "are net terms", and it is not usual to offer cash discounts, as is pointed out in García-Teruel and Martínez-Solano (2010).

Trade credit is widely offered by sellers to their customers. Pike and Cheng (2001) pointed out that most sales are made on credit, although firms try to reduce their bad debt risk exposure establishing credit limits for customers. In this sense, customer's financial statements are an important source for screening risk in firm trade credit practices (Pike and Cheng, 2001), so firms with higher credit quality should receive more credit from their suppliers, given that these face a lower moral hazard problem. Other studies, such as Petersen and Rajan (1997) and Niskanen and Niskanen (2006), show that proxies of information asymmetry, such as size and age, are related to trade credit.

Several papers have studied the economic consequences of earnings quality based on the reduction of information risk (mainly accruals quality) and information asymmetries. There is also analytical research (Trueman and Titman, 1988) and survey research for U.S. managers (Graham et al., 2005) that argues that more stable and predictable earnings is a desirable earnings attribute that should have positive economic consequences for firm valuation and other terms of the firm's business, such as trade credit.

Most of these studies on the economic implications of earnings quality have focused on capital markets, although recent papers study how accounting information

affects private debt contracts (Bharath et al, 2008; Ball, Bushman and Vasvari, 2008; Hasan et al., 2012). Bharath et al. (2008) and Hasan et al. (2012) report similar results for the effect of accruals quality and earnings predictability, respectively, on bank loan terms: firms with higher earnings quality face significantly lower interest spreads, longer maturity of loans, and lower collateral. Likewise, Ball et al. (2008) find that earnings quality influences the structure of syndicated loan.

Our study focuses on the effects of earnings quality on suppliers, the main private lenders other than banks in SMEs and code law countries, and we hypothesize that more precise earnings with respect to cash flows and less volatile and more predictable earnings should have a positive effect on trade credit received from suppliers. Nevertheless, according to Dechow et al. (2010), earnings quality depends on two factors: the relevance of underlying financial performance to a specific decision model, and the ability of the accounting system to measure performance. The underlying financial performance is assumed to be of higher quality when it is more persistent and predictable, and it may be determined by economic and business-level factors outside the accounting system and beyond managers' decision over accounting rules. These factors are associated with the type of industry, the business strategy of the firm or even firm characteristics. In this sense Lev (1983) identifies product type, the industry barriers-to-entry, capital intensity, and firm size, whereas Fairfaild and Yohn (2001) and Soliman (2008) focus on asset turnover, profit margin and their changes. On the other hand, Francis et al. (2004 and 2005) consider as *innate* determinants of earnings quality, i.e., those that depend on the business model and the operating environment, firm size, the volatility of operating cash flows, the volatility of sales, the length of the operating cycle and the frequency of negative earnings. Accordingly, we

have controlled for industry and these *innate* determinants of earnings quality in order to remove the effect of the business model from earnings quality measures.

In contrast to these innate determinants of earnings quality, the *discretionary* determinants of earnings quality proxies (Francis et al., 2004 and 2005) have to do with the reporting process: first, the accounting standards and those factors associated with their implementation, such as the level of enforcement (Leuz, Nanda and Wysocki, 2003; Holthausen, 2009); second, those issues related with the discretionary intervention of management in the preparation of financial information due to the flexibility of the accounting standards. In this way, earnings quality depends on fair interpretation and estimates based on accounting principles, but it can be also affected by managers' incentives to manipulate financial reporting that arise from explicit or implicit contracts with owners and providers of finance (bonus plan, debt covenants) or with the government (political costs). In addition, there are incentives linked to firm valuation which can also affect earnings quality, such as beating earnings' targets or getting a smooth path of earnings.

We have also controlled for other factors traditionally considered as determinants of suppliers' financing. First, access to trade credit is related with the size and age of the firm. Larger and older firms should receive more supplier financing due to their higher credit quality and lower information asymmetry (Petersen and Rajan, 1997). However, they might also use less financing from suppliers, since they can access other sources of finance, and trade credit is more important when firms are smaller, younger, and more opaque (Berger and Udell, 1998).

A firm's liquidity may also affect the demand for trade credit. Firms with a greater capacity to generate internal funds have more resources available and, consequently, they will decrease their demand for financing from their suppliers

(Petersen and Rajan, 1997, Deloof and Jegers, 1999; Niskanen and Niskanen, 2006).

Accounts payable also depend on the availability of financial resources from banks and their cost. Previous literature has found that firms increase their demand for trade credit to overcome financial constraints (Schwartz, 1974, Elliehausen and Wolken, 1993; Petersen and Rajan, 1997; Danielson and Scott, 2004; Huyghebaert, 2006; Cuñat, 2007). In this respect, we expect the short-term bank debt to be negatively related with supplier financing, since access to short-term bank debt could reduce the need for trade credit. According to Deloof and Jegers (1999), long-term bank debt can be a determinant of supplier financing if there is a substitution effect between long-term debt and debt provided by suppliers. We also consider the cost of external finance and expect firms incurring higher costs for their financial debt to demand more financing from their suppliers. However, a higher cost is usually associated with lower creditworthiness, and hence a negative relationship would be expected.

The existence of growth opportunities in a firm is an important factor that positively affects the demand for finance in general and for trade credit in particular. In fact, as Cuñat (2007) points out, high growth firms obtain more trade credit from their suppliers. We expect that firms with higher sales growth will have greater growth opportunities, so they will show an increased demand for funds and, consequently, for trade credit.

3. INSTITUTIONAL SETTING AND EARNINGS MANAGEMENT IN SPAIN

We now briefly describe the main Spanish features of earnings management practices in order to highlight the informativeness of earnings in Spain and its implications for trade credit.

Spain is a code-law country characterized, in comparison to Anglo-Saxon countries such as US and UK, by a less-developed stock market and high concentration of ownership. Consequently, a large proportion of financing is provided by banks and suppliers, and the main agency conflicts shift from that between managers and shareholders (typical of Anglo-Saxon countries) to that between majority shareholders (who control managers) and minority shareholders, and between these managers/shareholders and creditors.

Previous studies in accounting quality literature have found that financial reporting quality depends not only on the quality of the accounting standards but also on their enforcement (Leuz, et al., 2003; Holthausen, 2009), the incentives of managers and auditors (Ball, Robin and Wu, 2003), and that quality is lower in private firms (Ball and Shivakumar, 2005; Burgstahler et al., 2006). Some of these studies characterize Spain in terms of earnings management as a country with a high degree of manipulation in small loss avoidance and with a level of smoothness similar to other code-law countries (Leuz et al., 2003; Bhattacharya et al., 2003; Kinnunen and Koskela, 2003; Burgstahler et al., 2006). For instance, in the Leuz et al. (2003) study, Spain is the second country out of 31 in small loss avoidance. One study on these practices in Spain (Parte, 2008) shows that the main items manipulated by Spanish companies to beat earnings benchmarks are extraordinary items. However, when considering the aggregate summary measure of earnings management of some of these studies, e.g., Leuz et al. (2003) -which includes smoothness, magnitude of accruals, and small loss avoidance- Spain comes 14th out of 31 countries. This is consistent with the findings of the above-mentioned studies with regard to the influence of institutional characteristics and incentives in financial reporting quality that characterize earnings management in code law countries as being higher than in Anglo-Saxon countries.

The implication of these findings is that financial reporting quality has a more limited role in countries like Spain than in those with higher enforcement and more developed capital markets, but the use of aggressive earnings management to "jump" zero and report positive earnings is also an indicator of the incentives of managers to access the financing provided by banks and suppliers. In this sense, some studies have found that financial reporting quality in Spain "matters", because it has economic implications in the debt market for obtaining lower debt costs (Gill-de-Albornoz and Illueca, 2007) and longer debt maturity (García-Teruel, Martínez-Solano and Sánchez-Ballesta, 2010) in large firms, and because accruals have information content to predict future cash flows (Arnedo, Lizarraga and Sánchez, 2012).

4. MODEL SPECIFICATION AND DEFINITION OF VARIABLES

4.1. Model specification

Using the theoretical framework, we tested the effect of earnings quality on accounts payable by estimating the following model:

Accounts Payable$_{it}$= Intercept +δ_0Earnings Quality$_{it}$ +δ_1Operating Cycle$_{it}$+ +$\delta_2\sigma(SALES)_{it}$ +$\delta_3\sigma(CFO)_{it}$ +δ_4Negative Earnings$_{it}$ + δ_5Size$_{it}$ + δ_6Age$_{it}$ +δ_7Internal funds$_{it}$+ +δ_8Shor-term Bank Debt$_{it}$ +δ_9Long-Term Bank Debt$_{it}$ +δ_{10}Financial Cost$_{it}$+ +δ_{11}Positive Growth$_{it}$ + δ_{12}Negative Growth$_{it}$ + δ_{13}Purchases$_{it}$ +λ_t +I_i +ε_{it}   (1)

where the dependent variable *Accounts Payable$_{it}$* represents the funding received by firm i at time t from its suppliers and is calculated as the ratio of accounts payable to total assets. With *Earnings Quality$_{it}$* we analyze the effect of earnings quality on accounts payable, and we explain below the different measures used. We control by the innate determinants of earnings quality in order to the variable *Earnings Quality* represents the factors associated with the reporting process: *Operating Cycle$_{it}$* represents the length of the operating cycle measured as days of accounts receivable plus days of

inventories; $\sigma(SALES)_{it}$ is the standard deviation of sales; $\sigma(CFO)_{it}$ the standard deviation of cash flow from operations; *Negative Earnigns*$_{it}$ represents the percentage of years in which earnings are negative. The last three variables are calculated using a rolling four-year window. *Size*$_{it}$ represents firm's size. Additionally, we control for determinants of trade credit: *Age*$_{it}$ indicates the age of the company; *Internal funds*$_{it}$ the capacity to generate internal resources; *Short-Term Bank Debt*$_{it}$ the short-term financing received from financial institutions; *Long-Term Bank Debt*$_{it}$ the proportion of long-term debt; *Financial Cost*$_{it}$ the cost of outside financing; *Positive Growth*$_{it}$ and *Negative Growth*$_{it}$ the positive and negative sales growth, respectively; and *Purchases*$_{it}$ the purchases made to suppliers. We also include industry and year dummies.

4.2. Earnings quality metrics

We use several accounting-based measures of earnings quality used in previous papers to assess the economic implications of earnings quality (Francis et al., 2004 and 2005; Hasan et al., 2012): earnings variability before smoothness, earnings smoothing, earnings predictability and accruals quality.

Earnings_variability before smoothness: We calculate earnings variability before smoothness as firm i's standard deviation of the ratio of net income before extraordinary items with respect to initial total assets (Francis et al., 2004), calculated over a period of five years (σ_{NI}).

Smoothness: We define *Smoothness* as earnings variability before smoothness divided by the standard deviation of the ratio of cash flows from operations with respect to initial total assets, i.e., (σ_{NI}/σ_{CFO}) (Francis et al., 2004), where both standard deviations are calculated over a period of five years. The more income smoothing, the less the variability of income with respect to variability in cash flows, so a lower value

of *Smoothness* would indicate a smoother income. We use $1/(\sigma_{NI}/\sigma_{CFO})$ for easier interpretation of results according to the following earnings quality measures.

Predictability: Our measure of earnings predictability is the standard deviation of residuals from the AR(1) time-series model (Lipe, 1990), which has also been used by Francis et al. (2004) and Hasan et al. (2012):

$$Earnings_{i,t} = \beta_0 + \beta_1 Earnings_{i,t-1} + \varepsilon_{i,t} \qquad (2)$$

where $Earnings_{i,t}$ is the earnings for firm i at the year t deflated by total assets. We estimate equation (2) using rolling 6-year windows, and the standard deviation of the error variance ($\sqrt{\sigma^2(\hat{\varepsilon}_i)}$) is an inverse measure of earnings predictability. In order to facilitate the interpretation of this variable, we use its negative value, which we define as *Predictability$_{it}$*. Large values of *Predictability* imply more predictable earnings.

Accruals quality: We employ a proxy widely used in accounting research (Francis et al., 2005; Bharath et al., 2008) to focus on the accuracy with which accruals convey information about cash flows to inform stakeholders, particularly investors and creditors.

We use the model developed by Dechow and Dichev (2002). In this model, accruals quality is measured as the extent to which current working capital accruals map onto operating cash flows of the prior, current and future periods.

$$\frac{WCA_{it}}{AvgAssets_{it}} = \beta_0 + \beta_1 \frac{CFO_{i,t-1}}{AvgAssets_{it}} + \beta_2 \frac{CFO_{i,t}}{AvgAssets_{it}} + \beta_3 \frac{CFO_{i,t+1}}{AvgAssets_{it}} + \varepsilon_{it} \qquad (3)$$

where WCA_{it} is working capital accruals of firm i in year t, calculated as the change in current assets *(ΔCA)*, minus the change in cash and cash equivalents *(ΔCash)*, minus the change in current liabilities *(ΔCL)* plus the change in short term bank debt *(ΔDebt)*.

CFO_{it}, CFO_{t-1}, and CFO_{t+1} signify cash flow from operations of firm i in years t, t-1 and t+1, respectively, calculated as the difference between net income before extraordinary items (*NIBE*) and total accruals (*TA*). Total accruals are calculated for each firm in year t as working capital accruals (WCA_{it}) minus depreciation and amortization expenses for the period (Dep_{it}). $AvgAssets_{it}$ represents the average total assets between t-1 and t of firm i in year t and is calculated as the mean of the firm's total assets in years t-1 and t.

Equation (3) is estimated in its cross-sectional version for each industry-year combination, at two-digit level of the Spanish Classification of National Activities (CNAE). The residual vector reflects working capital accruals unexplained by cash flows of the previous, current and subsequent periods. Therefore, the absolute value of the residual for each firm-year observation is an inverse measure of accruals quality ($|\hat{\varepsilon}_{it}|$). In order to facilitate the interpretation of this variable we use the negative value of $|\hat{\varepsilon}_{it}|$ which we define as *Accruals Quality_DD$_{it}$* (the higher the value of *Accruals Quality_DD$_{it}$*, the higher the accruals quality).

We also calculate a second proxy for accruals quality as the standard deviation of the residuals from the industry-year estimations of equation (3). In this case we consider the standard deviation of firm i's residuals from the industry-year regressions, $\hat{\varepsilon}_{it}$, calculated over periods t-4 to t, as an inverse measure of accruals quality, $\sigma(\varepsilon_i)_t$. Larger standard deviations of residuals indicate lower accruals quality. As previously, to make this variable easier to understand we use the negative value of $\sigma(\varepsilon_i)_t$, which we denote as *Accruals Quality_sdDD$_{it}$* (the higher the value of *Accruals Quality_sdDD$_{it}$*, the higher the accruals quality).

4.3. Definition of control variables

With regard to the determinants of trade credit, *Size* is calculated as the logarithm of the assets *Age* is the logarithm of (1+age), where age is the number of years since the foundation of the firm; *Internal funds* is measured as the sum of net income plus depreciation over assets; *Short-Term Bank Debt* is the ratio of short-term financial debt to assets; *Long-Term Bank Debt* is the ratio of long term debt to assets; *Financial Cost* is the ratio of financial expenses over total debt minus accounts payable; *Positive Growth* is calculated from the yearly positive variations in sales ($sales_0/sales_{-1}$) and *Negative Growth* from the yearly negative variations. Finally, we control for *Purchases* with the proxy cost of goods sold to assets.

5. SAMPLE AND DATA

We have used panel data from non-financial industrial Spanish SMEs for our analysis. We selected firms that fulfilled the SME requirements established by the European Commission's recommendation 2003/361/EC of 6 May, 2003, i.e. they had fewer than 250 employees, an annual turnover of less than 50 million euros and possessed less than 43 million euros worth of total assets.

The principal source of information is the SABI (Spanish Balance Sheets Analysis System) database, which contains accounting and financial information of Spanish firms, and was developed by Bureau Van Dijk.

Data were collected for the period 1995-2005. Next, we refined the information, eliminating lost values and cases with accounting errors. Then, we calculated the earnings quality variables used in our study As a consequence of the information requirements of these variables (availability of accounting data, standard deviations that require consecutive observations over five year windows for some of these variables, and the estimates of others- *Predictability* and *Accruals Quality_DD*- based on standard

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deviations of residuals of previous models), the number of observations is not homogeneous for the different earnings quality measures. We calculated the rest of variables presented in equation 1 using a sample of 1,301 Spanish SMEs and 8,396 firm-year observations[1].

6. EMPIRICAL FINDINGS

6.1 Descriptive statistics and preliminary analysis

Table I summarizes the descriptive statistics of our sample. The sample consists of SMEs firms with average assets of around €10.7 million and an average age of 26.22 years[2]. The level of accounts payable represents a significant value of their assets, 21.73% on average. The short term and long term financial debt are, on average, 28.15% and 18.03% and the mean cost of outside financing is 6.5%. In addition, the average internal funds generated is 8.78% over assets.

INSERT TABLE I

The Pearson correlation matrix is presented in table II. All earnings quality proxies are correlated, with the expected sign, with accounts payable. Specifically, correlations show that the lower the earnings variability before smoothness, and the higher the smoothness, the earnings predictability and the accruals quality, the higher the financing from supplier. These results present preliminary evidence of the relation between earnings quality and accounts payable according to the hypotheses developed in section 2. Moreover, all earnings quality variables show the expected associations with each other (positive and significant correlations between smoothness, predictability

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[1] This is the most extensive number of firm-year observations used to calculate the earnings quality variables.
[2] In Table I we present descriptive statistics for logarithm of assets and logarithm of (1+age).

and accruals quality, and negative and significant correlations of these variables with earnings variability before smoothness). Finally, we did not detect high correlations between independents variables, which suggests that there are no multicollinearity problems.

INSERT TABLE II

In table III, we present the mean values of the proxies of earnings quality by deciles 1 and 10 of accounts payable. Decile 1 represents the mean value of earnings quality variables for firms with the lowest supplier financing, and decile 10 for the firms with the highest supplier financing. We carried out a t test of difference of means to determine if the mean values of decile 1 are significantly different from those of decile 10. The t statistic is shown in the final column in Table III. The findings show that the difference between decile 1 and 10 is significantly different from zero for all earnings quality proxies with the exception of *Accruals Quality_sdDD*, indicating that supplier financing is higher in firms with lower earnings variability before smoothness, and higher smoothness, predictability, and accruals quality.

INSERT TABLE III

6.2 Regressions results

In table IV we present the results of the estimation of equation (1). We present six columns using the alternative proxies for earnings quality defined above. In column 1 we present results for *Earnings variability before smoothness*, in column 2 for *Smoothness*, in column 3 for *Predictability*, in column 4 and 5 for the two proxies of

accruals quality (*Accruals quality_DD* and *Accruals quality_sdDD*, respectively) and in column six for all proxies of earnings quality together (except *Predictability* due to the high correlation with *Earnings variability*).We estimate equation (1) using robust standard errors (Huber/White estimator or sandwich estimator of variance).

INSERT TABLE IV

In relation to explanatory variables traditionally studied in the field of accounts payable, our results are in line with the previous evidence. Specifically, the relation between the dependent variable and variables *Size* and *Age* is significant and negative. This relationship could be explained, as Niskanen and Niskanen (2006) point out, by the fact that older firms have relatively smaller investment opportunities than younger firms.

Like Pertersen and Rajan (1997) and Niskanen and Niskanen (2006), we also find that the dependent variable is negatively related with the *Internal funds* variable, and also with the *Short-term bank debt* and *Long-term bank debt* variables, as in Deloof and Jergers (1999). This suggests that the level of accounts payable is higher when firms have less capacity to generate internal funds, and when they have more difficulties obtaining other external funds. Accordingly, we find a positive and significant relationship with variable *Financial cost*, which indicates, as is found in Niskanen and Niskanen (2006), that higher cost of financing makes trade credit more competitive than other funds.

The results also show a positive effect of *Positive growth* on accounts payable. This could be explained in two ways. First, because firms with higher growth need more funds in general and, subsequently, more trade credit. Second, because suppliers could

consider that firms with higher growth are more likely to pay their purchases in the future. The control variable *Purchases* is also significant and positive.

With respect to our key variables, the results support the expected relationship between earnings quality and suppliers financing. The estimated coefficients for the earnings quality proxies have the expected signs and are significant in four out of five regressions. Specifically, we find that the coefficient for *Smoothness* is positive and significant at the 10% level, indicating, as hypothesized, that firms which smooth earnings present more accounts payable. We also find a positive coefficient, significant at the 1% level, for *Predictability*, showing that the more predictable earnings, the more supplier financing there is. Additionally, the estimated coefficients for both proxies of accruals quality, *Accruals quality_DD* and *Accruals quality_sdDD*, are positive and significant at the 1% level, which suggests that the higher the accruals quality, the higher the financing obtained from suppliers. In the case of *Earnings variability*, the coefficient presents the expected sign and is close to being significant (*t statistics*= -1.53) in column 1 (but it becomes not significant in column 6). The results in column 6, considering all earning quality variables except *Predictability*, are consistent with the different dimensions of earnings quality playing a role in determining supplier financing[3]. These findings are consistent with the hypothesis that accounting quality reduces information asymmetry between the firm and suppliers and also with the expectation that more stable and predictable earnings favour access to more trade credit.

In general, our findings show that even though financial reporting quality has a more limited role in countries like Spain than in those with higher enforcement and more developed capital markets, it does still matter. This is consistent with previous research, such as Chen, Hope, Li and Wang (2011), which shows that financial

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[3] The results do not change if other economic determinants of earnings quality such as margin and turnover are included.

reporting quality is important in contexts of private firms and low enforcement, where accounting quality is expected to be less useful than in US and UK publicly traded firms.

CONCLUSIONS

The aim of this research is to examine the effect of firms' earnings quality on suppliers financing. Our paper contributes to both the literature on the determinants of trade credit received form sellers and the literature on the economic consequences of accounting quality for private lenders. We use data collected for the period 1995-2005 for a sample of industrial Spanish firms.

The results show that firms with lower earnings variability before smoothness and higher smoothness, predictability, and accruals quality have access to more trade credit from suppliers. This suggests that, besides the information obtained in the commercial relation with the customers, suppliers also give importance to earnings quality and offer more trade credit to those firms with less volatile, more predictable and more precise earnings. This result is consistent with earnings quality playing a role in the reduction of information asymmetries between suppliers and customers, but also, in the case of those measures associated with volatility of earnings, with a more stable series of earnings favouring the financing from suppliers. In this sense, although we have controlled for some economic factors that determine earnings quality (and so proxies for earnings quality mainly represent the reporting process effect), the associations found may be affected by other features which are difficult to isolate, such as the business strategy of the firm or the product type, which may shape the underlying performance of the firm. Thus, more stable series of earnings due to these intrinsic characteristics of the business would imply higher supplier financing regardless of the

role played by the reporting system. This is a caveat of this study which we leave to be better addressed in the future.

Our results also indicate that firms reduce the level of accounts payable when they have more capacity to generate internal funds. Moreover, the availability of alternative financial resources (short term financial debt and long term debt) leads to reduced financing from suppliers. We also find that firms use more trade credit when they have more growth opportunities. This confirms that firms use trade credit as a particular means of financing their sales growth.

Since our findings show that the quality of earnings is a determinant of the trade credit received, they have important implications for assessments of financial reporting quality. If, as our results suggests, sellers incorporate the quality of earnings as a valuable factor in their decisions about trade credit granted to customers, managers should be concerned about earnings quality because by improving this, they could design more efficient corporate financing policies, in particular with regard to access to suppliers' financing. Since the financial literature shows that trade credit is perceived by financial intermediaries as a favourable signal of the creditworthiness of the borrower, our results could also suggest that accounting quality might be relevant for obtaining other external funds.

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Tables

Table I: Descriptive statistics

Accounts payable represents the funding received from suppliers and is calculated as the ratio of accounts payable to total assets; *Earnings variability before smoothness* is the firm i's standard deviation of the ratio of net income before extraordinary items with respect to initial total assets; *Smoothness* is the inverse of earnings variability before smoothness divided by the standard deviation of the ratio of cash flow from operation with respect to initial assets; *Predictability* is the standard deviation of residuals from AR(1) time series model for earnings deflated by total assets; *Accruals quality_DD* measures accruals quality as the negative value of the absolute value of the residuals according to the Dechow and Dichev (2002) model; *Accruals quality_sdDD* is the negative value of the standard deviation of the residuals from the industry-year estimations of the Dechow and Dichev (2002) model; *Operating cycle* measures the length of the operating cycle; $\sigma(SALES)$ is the standard deviation of Sales over a period of four years; $\sigma(CFO)$ is the standard deviation of CFO over a period of four years; *Negative earnings* is the proportion of years, over the last four, in which earnings are negative; *Size* is the logarithm of the assets; *Age* is defined as the logarithm of (1+age); *Internal funds* the capacity to generate internal resources; *Short-term bank debt* the short-term financing received from financial institutions; *Long-term bank debt* the long-term debt; *Financial cost* the cost of outside financing; *Positive growth* and *Negative growth* the positive and negative sales growth, respectively; and *Purchases* the ratio cost of goods sold to assets.

	Observations	Mean	Std. Dev.	Perc 10	Median	Perc 90
Accounts payable	8396	0.2173	0.1143	0.0860	0.1981	0.3716
Earnings variability	6436	0.0343	0.0657	0.005	0.0255	0.0642
Smoothness	6436	5.3055	13.0052	1.2170	3.1864	10.8227
Predictability	3834	-0.0295	0.0258	-0.0569	-0.0229	-0.0081
Accruals Quality_DD	8396	-0.0317	0.0292	-0.0680	-0.0240	-0.0045
Accruals Quality_sdDD	3834	-0.0307	0.0192	-0.0537	-0.0264	-0.0118
Operating cycle	8396	231.5733	146.7018	118.4565	201.5488	369.0984
σ(SALES)	7528	0.1618	0.1333	0.0501	0.1251	0.3134
σ(CFO)	7528	0.0861	0.0548	0.0311	0.0739	0.1555
Negative Earnings	8396	0.1425	0.2396	0	0	0.5
Size	8396	9.1135	0.5814	8.3666	9.0950	9.8907
Age	8396	3.1290	0.5322	2.4849	3.1354	3.7377
Internal funds	8396	0.0878	0.0591	0.0307	0.0801	0.1620
Short-term debt	8396	0.2815	0.1684	0.0528	0.2806	0.5041
Long-term debt	8396	0.1803	0.1455	0.0158	0.1520	0.3887
Financial cost	8396	0.065	0.6934	0.0233	0.0500	0.1110
Positive growth	8396	0.7860	0.5761	0	1.0547	1.2529
Negative growth	8396	0.289	0.4271	0	0	0.9657
Purchases	8396	0.7569	0.4758	0.2804	0.6747	1.2899

Table II: Correlation matrix

Accounts payable represents the funding received from suppliers and is calculated as the ratio of accounts payable to total assets; *Earnings variability before smoothness* is the firm i's standard deviation of the ratio of net income before extraordinary items with respect to initial total assets; *Smoothness* is the inverse of earnings variability before smoothness divided by the standard deviation of the ratio of cash flow from operation with respect to initial assets; *Predictability* is the standard deviation of residuals from AR(1) time series model for earnings deflated by total assets; *Accruals quality_DD* measures accruals quality as the negative value of the absolute value of the residuals according to the Dechow and Dichev (2002) model; *Accruals quality_sdDD* is the negative value of the standard deviation of the residuals from the industry-year estimations of the Dechow and Dichev (2002) model; *Operating cycle* measures the length of the operating cycle; $\sigma(SALES)$ is the standard deviation of Sales over a period of four years; $\sigma(CFO)$ is the standard deviation of CFO over a period of four years; *Negative earnings* is the proportion of years, over the last four, in which earnings are negative; *Size* is the logarithm of the assets; *Age* is defined as the logarithm of (1+age); *Internal funds* the capacity to generate internal resources; *Short-term bank debt* the short-term financing received from financial institutions; *Long-term bank debt* the long-term debt; *Financial cost* the cost of outside financing; *Positive growth* and *Negative growth* the positive and negative sales growth, respectively; and *Purchases* the ratio cost of goods sold to assets. ***, **, * denotes significance at the 1%, 5%, and 10% level respectively.

	Accounts payable	Earnings variability	Smoothness	Predictability	Accruals Quality_DD	Accruals Quality_sdDD	Operating cycle	σ(SALES)	σ(CFO)
Accounts payable	1								
Earnings variability	-0.0385***	1							
Smoothness	0.0715***	-0.0969***	1						
Predictability	0.0938***	-0.8307***	0.1479***	1					
Accruals Quality_DD	0.0277**	-0.1197***	0.0381***	0.2649***	1				
Accruals Quality_sdDD	0.0311*	-0.6276***	0.0366**	0.5384***	0.4997***	1			
Operating cycle	-0.2226***	0.0126	0.012	-0.0281*	-0.0201*	-0.0529***	1		
σ(SALES)	0.1635***	0.0864***	0.0435***	-0.1959***	-0.1358***	-0.2485***	-0.1672***	1	
σ(CFO)	0.0888***	0.0778***	0.2006***	-0.2119***	-0.1715***	-0.3223***	-0.0190*	0.3267***	1
Negative Earnings	-0.0501***	0.0622***	-0.0095	-0.1089***	-0.143***	-0.1800***	0.0972***	0.0456***	0.0836***
Size	-0.2023***	-0.0022	-0.0343***	-0.0042	0.0411***	0.0259	0.1641***	-0.1236***	-0.1059***
Age	-0.1159***	-0.0905***	-0.0231*	0.0404**	0.0341***	0.0414**	0.116***	-0.1226***	-0.0624***
Internal funds	-0.119***	0.0658***	-0.0916***	-0.1083***	-0.0334***	0.0018	-0.2054***	-0.0559***	-0.0397***
Short-term debt	-0.1847***	-0.0649***	0.0706***	0.1115***	0.0539***	0.0590***	0.1516***	-0.0423***	0.0260**
Long-term debt	-0.3298***	0.0097	-0.0084	0.0223	0.0281***	0.0178	0.0302***	0.0196*	-0.0335***
Financial cost	0.191***	0.0037	0.0023	-0.0216	0.0008	-0.0308*	-0.07***	0.0266**	0.0130
Positive growth	0.1037***	0.0186	0	0.0138	-0.0086	0.0352**	-0.1707***	0.0093	-0.0339***
Negative growth	-0.0892***	0.0025	-0.0004	-0.0326**	-0.0215**	-0.0493***	0.1488***	0.0255**	0.0603***
Purchases	0.4234***	-0.0531***	0.0719***	0.0967***	0.0084	-0.0143	-0.4499***	0.377***	0.1209***

	Negative Earnings	SIZE	AGE	Internal funds	Short-term debt	Long-term debt	Financial cost	Positive growth	Negative growth	Purchases
Negative Earnings	1									
Size	-0.0322***	1								
Age	-0.0208**	0.1084***	1							
Internal funds	-0.3408***	-0.0231**	-0.0637***	1						
Short-term debt	0.0691***	0.036***	0.0334***	-0.26***	1					
Long-term debt	0.1408***	0.0964***	-0.0644***	-0.0247**	-0.2609***	1				
Financial cost	-0.0502***	-0.0985***	-0.0216**	0.0189*	-0.1192***	-0.1499***	1			
Positive growth	-0.071***	0.05***	-0.0769***	0.1603***	-0.0382***	-0.0267**	-0.0253**	1		
Negative growth	0.0832***	-0.0428***	0.0627***	-0.1436***	0.0354***	0.0216**	0.029***	-0.9233***	1	
Purchases	-0.0548***	-0.2317***	-0.0704***	-0.0717***	0.0052	-0.2643***	0.1607***	0.0792***	-0.0608***	1

Table III: Earnings quality by deciles of accounts payable

Accounts payable represents the funding received from suppliers and is calculated as the ratio of accounts payable to total assets; *Earnings variability before smoothness* is the firm i's standard deviation of the ratio of net income before extraordinary items with respect to initial total assets; *Smoothness* is the inverse of earnings variability before smoothness divided by the standard deviation of the ratio of cash flow from operation with respect to initial assets; *Predictability* is the standard deviation of residuals from AR(1) time series model for earnings deflated by total assets; *Accruals quality_DD* measures accruals quality as the negative value of the absolute value of the residuals according to the Dechow and Dichev (2002) model; *Accruals quality_sdDD* is the negative value of the standard deviation of the residuals from the industry-year estimations of the Dechow and Dichev (2002) model. ***, **, * denotes significance at the 1%, 5%, and 10% level respectively.

	Decile 1	Decile 10	Diff.	t
Earnings variability	0.0369	0.0286	-0.0082	5.218***
Smoothness	4.4390	8.1546	-3.7156	-2.415**
Predictability	-0.0327	-0.0259	-0.0068	-3.733***
Accruals Quality_DD	-0.0358	-0.0309	-0.0049	-3.184***
Accruals Quality_sdDD	-0.0339	-0.0320	-0.0019	-1.1620

Table IV: Accruals quality and accounts payable

Accounts payable represents the funding received from suppliers and is calculated as the ratio of accounts payable to total assets; *Earnings variability before smoothness* is the firm i's standard deviation of the ratio of net income before extraordinary items with respect to initial total assets; *Smoothness* is the inverse of earnings variability before smoothness divided by the standard deviation of the ratio of cash flow from operation with respect to initial assets; *Predictability* is the standard deviation of residuals from AR(1) time series model for earnings deflated by total assets; *Accruals quality_DD* measures accruals quality as the negative value of the absolute value of the residuals according to the Dechow and Dichev (2002) model; *Accruals quality_sdDD* is the negative value of the standard deviation of the residuals from the industry-year estimations of the Dechow and Dichev (2002) model; *Operating cycle* measures the length of the operating cycle; *σ(SALES)* is the standard deviation of Sales over a period of four years; *σ(CFO)* is the standard deviation of CFO over a period of four years; *Negative earnings* is the proportion of years, over the last four, in which earnings are negative; *Size* is the logarithm of the assets; *Age* is defined as the logarithm of (1+age); *Internal funds* the capacity to generate internal resources; *Short-term bank debt* the short-term financing received from financial institutions; *Long-term bank debt* the long-term debt; *Financial cost* the cost of outside financing; *Positive growth* and *Negative growth* the positive and negative sales growth, respectively; and *Purchases* the ratio cost of goods sold to asset. *t statistics* in brackets. ***, **, * denotes significance at the 1%, 5%, and 10% level respectively. All the estimations have been carried out using robust standard errors.

	1	2	3	4	5	6
Earnings variability	-0.0733					-0.0415
	(-1.53)					(-1.05)
Smoothness		0.0004*				0.0003*
		(1.73)				(1.71)
Predictability			0.4779***			
			(3.95)			
AccrualsQuality_DD				0.2427***		0.1903***
				(5.80)		(3.95)
AccrualsQuality_sdDD					0.5356***	0.2237***
					(5.28)	(2.73)
Operating cycle	$-0.4e^{-4}$***	$-0.4e^{-4}$***	$-0.4e^{-4}$***	$-0.4e^{-4}$***	$-0.4e^{-4}$***	$-0.4e^{-4}$**
	(-4.75)	(-4.92)	(-4.22)	(-4.82)	(-4.23)	(-4.57)
σ(SALES)	0.0050	0.0035	0.0286	0.0111	0.0233	0.0150
	(0.38)	(0.27)	(1.5)	(0.99)	(1.28)	(1.15)
σ (CFO)	0.0464*	0.0223	0.0770**	0.0567**	0.0925***	0.0634**
	(1.81)	(0.82)	(2.2)	(2.46)	(2.58)	(2.29)
Negative earnings	-0.0059	-0.0062	0.0078	-0.0064	0.0074	0.0023
	(-1.06)	(-1.14)	(1.14)	(-1.24)	(1.11)	(0.42)
Size	-0.0126***	-0.0125***	-0.0090***	-0.0141***	-0.0093***	-0.0122***
	(-6.03)	(-6.01)	(-3.38)	(-7.29)	(-3.50)	(-5.83)
Age	-0.0208***	-0.0200***	-0.0225***	-0.0200***	-0.0223***	-0.0206***
	(-9.09)	(-8.77)	(-7.13)	(-9.70)	(-7.10)	(-8.84)
Internal funds	-0.4158***	-0.4139***	-0.3513***	-0.4300***	-0.3719***	-0.3937***
	(-15.72)	(-15.69)	(-10.51)	(-17.94)	(-11.17)	(-15.03)
Short-term bank debt	-0.1899***	-0.1898***	-0.1725***	-0.1970***	-0.1686***	-0.1938***
	(-21.22)	(-21.15)	(-14.76)	(-24.13)	(-14.25)	(-21.71)
Long-term bank debt	-0.2298***	-0.2295***	-0.2169***	-0.2420***	-0.2116***	-0.2345***
	(-22.89)	(-22.92)	(-17.08)	(-26.01)	(-16.89)	(-23.39)
Financial cost	0.0579**	0.0576**	0.0355	0.0678***	0.0377	0.0536**

	(2.24)	(2.21)	(1.33)	(2.61)	(1.35)	(2.10)
Positive growth	0.0335***	0.0323***	0.0374***	0.0308***	0.0358**	0.0345***

	(2.24)	(2.21)	(1.33)	(2.61)	(1.35)	(2.10)
Positive growth	0.0335***	0.0323***	0.0374***	0.0308***	0.0358**	0.0345***