

# DETERMINANTS OF TRADE CREDIT: A COMPARATIVE STUDY OF EUROPEAN SMEs

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## Abstract

This paper presents the analysis of the determinants of the trade credit granted and received by a panel of 47,197 SMEs in Europe over the period 1996-2002. Our results show a strong homogeneity in the factors determining trade credit in European countries. On the one hand, firms with greater capacity to obtain resources from the capital markets, and more cheaply, grant more trade credit to their customers. Moreover, the results appear to support the price discrimination theory. We also found that firms react by increasing the credit they grant in an attempt to stem falling sales. On the other hand, larger firms, with greater growth opportunities and greater investment in current assets, receive more finance from their suppliers. Where firms have alternative sources of finance they are less likely to resort to vendor financing (substitution effect).

**Keywords:** Trade credit, SMEs, European countries.

**JEL classification:** G31, G32.

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# **DETERMINANTS OF TRADE CREDIT: A COMPARATIVE STUDY OF EUROPEAN SMEs**

## **1. INTRODUCTION**

Trade credit occurs when there is a delay between the delivery of goods or the provision of services by a supplier and their payment. For the seller this represents an investment in accounts receivable, while for the buyer it is a source of financing that is classed under current liabilities on the balance sheet. The level of accounts receivable (accounts payable) over assets for the countries considered in this study ranges from 39.28% in Spain (28.52% in France) to 19.18% in Finland (13.17% in Finland).

The literature offers various theories to explain the use of trade credit based on the advantages for suppliers and for customers from the operational, commercial and financial perspective. First, trade credit enables firms to create operating efficiencies and cost improvements by separating the exchange of goods and their payment. This reduces cash uncertainty in their payments (Ferris, 1981) and provides more flexibility to respond to variations in demand (Emery, 1984, 1987). Second, from a commercial perspective, trade credit may stimulate sales in a number of ways. Terms of payment make it possible to modify the price of goods sold, in response to the increasing period of credit or by increasing the discount for prompt payment, which is an implicit price reduction, and in these ways trade credit can be used as a mechanism of price discrimination (Brennan, Maksimovic, and Zechner, 1988; Petersen and Rajan, 1997). Moreover, trade credit can be used to maintain long-term relationships with customers (Ng et al, 1999), and suppliers may be interested in the survival of their customers, due to the shared rent from long standing business relationships (Cuñat, 2007). Trade credit also allows sellers to offer quality guarantees to buyers and gives buyers time to assess product quality before paying. (Smith, 1987; Lee and Stowe, 1993; Long, Malitz, and

Ravid, 1993). Finally, in relation to financial motives, firms with better access to the credit market and with lower costs can act as financial intermediaries and grant financing to firms that find it difficult to access to credit (Schwartz, 1974; Emery, 1984; Mian and Smith, 1992). Moreover, the use of trade credit can help firms to obtain bank financing, since trade credit transmits information about the borrower's creditworthiness to the credit institution (Biais and Gollier, 1997).

Trade credit is particularly important for firms that have more difficulty funding themselves through credit institutions, as is the case for small and medium-sized enterprises (SMEs), whose access to the capital markets is very limited (Petersen and Rajan, 1997), and who use less external finance, especially bank finance (Beck, Demirgüç-Kunt and Maksimovic, 2008), and rely more on short-term debt finance (García-Teruel and Martínez-Solano, 2007; Peel, Wilson and Howorth, 2000). In spite of the importance of trade credit for SMEs, given their greater difficulty in accessing the capital markets, most previous studies that analyzed the determinants of trade credit granted and received have focused on large firms (Long *et al.*, 1993; Deloof and Jegers, 1996; Deloof and Jegers, 1999; Cheng and Pike, 2003; Pike, Cheng, Cravens and Lamminmaki, 2005, among others). Empirical evidence about small and medium-sized firms is scarce and focused on Anglo-Saxon countries such as the US (Petersen and Rajan, 1997; Elliehausen and Wolken, 1993) or the United Kingdom (Wilson and Summers, 2002). An exception is the study by Niskanen and Niskanen (2006), which focused on small Finnish firms. These previous studies show the important influence of operational, financial, and commercial motives on trade credit (Petersen and Rajan, 1997, Elliehausen and Wolken, 1993), while Niskamen and Niskamen (2006) found that price discrimination was not a determinant of small Finnish firms' trade credit policies.

This paper uses a firm-level database to examine the trade credit decisions of small firms in a sample of seven European countries (Belgium, Finland, France, Greece, Spain, Sweden and the United Kingdom). The purpose of this study is twofold: first, to provide evidence on the role of trade credit in European small and medium sized firms, and second, since there are important differences in trade credit levels between countries (Demirgüç-Kunt and Maksimovic, 2002; Marotta, 2005), to analyze whether the factors that determine the level of trade credit differ among the European countries. Moreover, from a methodological perspective, the current work improves on previous work analyzing small and medium-sized firms by using panel data methodology. This methodology allows us to study the determinants of trade credit by considering the evolution of the firms over time. It also offers the advantage that we can control for the existence of unobservable heterogeneity, as more than one cross-section is used (Baltagi, 2001; Wooldridge, 2002).

Our results show that trade credit determinants are in general consistent among the different European countries in spite of the differences in the level of trade credit granted and received. Specifically, with regard to trade credit granted, firms finance a higher proportion of their sales when they are larger, have greater access to short-term finance, experience lower sales growth, generate higher margins, have higher turnover of assets, and incur lower costs for their outside finance. Furthermore, financing through suppliers is higher in larger firms, those with higher sales growth, higher investment in current assets, and less access to alternative financing, whether in the form of internally generated cash flows or short-term or long-term debt. Resorting to suppliers for financing also increases when debt becomes more costly.

The remainder of this paper is organized as follows: in Section 2 we review the different theories explaining the extent of trade credit. In Section 3 we describe the

sample used. In the fourth section we present the description of the variables and the model specification. Subsequently, we comment on our results. The work ends with our main conclusions.

## **2. BACKGROUND**

The financial literature presents several theories to explain the existence and use of trade credit. Specifically, there are financial, operational, and commercial motives.

### *Financial motives*

The financial literature establishes that sellers of products have advantages over financial institutions when it comes to information acquisition and monitoring of debtors, and this enables certain non-financial firms with high creditworthiness to obtain funds to help other firms which have difficulties accessing capital markets because of their low credit rating (Schwartz, 1974; Emery, 1984; Smith, 1987; Mian and Smith, 1992; Petersen and Rajan, 1997). Specifically, suppliers may have greater ability to obtain information, due to the continuous contact with customers. The volume and frequency of orders can provide suppliers with information about their customer's current financial situation. Moreover, they have greater control of the customers, as the sellers can cut off supply of the merchandise which is purchased regularly. This is particularly important when there are few suppliers in the market, and the customers have a significant dependence on their supplier. Finally, sellers have advantages in the liquidation of the products sold in the case of non-payment. The merchandise is a more valuable collateral for suppliers than it is for financial institutions. In the case of non-payment, it can be recovered and sold to another customer. Thus, the level of trade credit will depend on the creditworthiness of the firm and the availability and cost of

financial resources from banks. Consequently, we expect that firms with easier access to the capital markets at less cost will grant more trade credit, while those with fewer financial options will resort more to trade credit from their suppliers.

### *Operational motives*

In the absence of trade credit firms would have to pay for their purchases on delivery. If the frequency of purchase is either unknown or varies in time, firms need to keep a precautionary level of cash holdings to settle these payments. Trade credit produces operating efficiencies and cost improvements through the separation of exchange of goods and payment. This makes it possible to reduce uncertainty about the level of cash that needs to be held to settle payments (Ferris, 1981) and provides more flexibility in the conduct of operations, since the capacity to respond to fluctuations is provided elsewhere (Emery, 1984, 1987). As Emery (1987) pointed out, this reason for extending trade credit is motivated purely by a desire to increase operating flexibility, and he suggests that when a firm's sales are cyclical or are subject to fluctuations they can use trade credit to provide a reward for customers who acquire merchandise in periods of low demand. In this way, by relaxing the credit terms the sellers can reduce the storage costs of the excessive inventories that would accumulate if they kept production constant. This also allows firms to avoid the cost of changing their production levels. This was supported by Long et al. (1993), who found that firms with variable demand granted a longer trade credit period than firms with stable demand. It follows that trade credit granted can be used to stimulate sales, and that we would therefore expect that firms may use more trade credit when their sales growth was low. Furthermore, the existence of sales growth in a firm is also a factor that positively affects the demand for finance in general, and for trade credit in particular.

Consequently we should expect that firms with greater increases in sales will use more trade credit in order to finance their new investment in current assets

### *Commercial motives*

Trade credit can be used as a form of price discrimination by firms, according to whether delays in payment are allowed or not (Brennan *et al.*, 1988; Mian and Smith, 1993). Prolonging the period of credit or raising the discount for prompt payment effectively equates to a price reduction. In this way, the same product can be sold at different prices to different customers. Petersen and Rajan (1997) found support for the price discrimination theory in a study which showed that firms with higher profit margins have more interest in raising their sales. This is due to the fact that the marginal earnings they obtain are high, allowing them to incur additional costs to generate new sales. The profits of this kind of firm come both from their commercial and their financial activities, and thus they can more readily accept lower returns on the finance they grant. Consequently we would expect firms with higher profit margins to increase their trade credit levels.

Trade credit also can be considered as a way for suppliers to offer implicit guarantees. In this respect, Smith (1987) pointed out that suppliers can transmit information about the quality of their products by agreeing credit terms that allow their customers a period of evaluation. Likewise, longer payment deadlines can be conceded when the quality of the product is difficult to evaluate or requires substantial time to analyze. Lee and Stowe (1993) argued that trade credit is the best way of guaranteeing products. Then we should expect that smaller and younger firms will make more use of

this type of implicit guarantee, since their customers may doubt their capacity to comply with the commitments they make, given that after the sale they could file for bankruptcy and not honour formal commitments. Long *et al.* (1993) found that smaller and younger firms grant more trade credit than firms with a more consolidated reputation in the market. Firms use trade credit to signal the quality of their products. More recently, Pike *et al.* (2005) demonstrated that, in the US, UK and Australia, trade credit can be used to reduce information asymmetries between buyers and sellers. Consequently, we would expect that firms with high product quality will offer more trade credit to their customers in order to allow them to evaluate product quality.

### **3. SAMPLE AND DATA**

The data used in this study were obtained from the AMADEUS database. This database was developed by Bureau van Dijk and it is a comprehensive, pan-European database containing financial information on 1.5 million public and private companies in European countries.

The sample in our study comprised small and medium-sized firms from seven European countries: Belgium, Finland, France, Greece, Spain, Sweden, and the UK, for the period 1996 to 2002. The selection of SMEs was carried out according to the requirements established by the European Commission recommendation 96/280/CE of 3<sup>rd</sup> April, 1996, on the definition of small and medium-sized firms. Specifically, the sample firms met the following conditions for at least three years: a) fewer than 250 employees; b) turnover less than €40 million; and c) possession of less than €27 million worth of total assets. Applying those criteria we selected a sample of around 200,000 SMEs.



After this first trawl, the information obtained was refined. In this way, we eliminated cases with missing values for some of the variables<sup>i</sup> or with errors in the accounting data. For example, we required that variables such as assets, current assets, fixed assets, liabilities, current liabilities and capital be positive, as well as any other variable defined as positive. In addition, we eliminated 1% of the extreme values (percentiles 1 and 99) presented by the variables defined in next section, which might alter the results. As a result of applying these filters, we ended up with a panel consisting of 47,197 firms and 185,157 observations.

Table I reports the mean values of trade credit granted and received by country and sector. We compared the levels of accounts receivable and payable between countries. The results indicate that the level of trade credit granted and received differs between countries<sup>ii</sup>. As regards the accounts receivable, we observe that this represents an important proportion of the assets of the sample firms. It is noteworthy that the countries from the continental model (Belgium, France, Greece, and Spain) exhibit the highest levels of accounts receivable (ranging from 35.42% for Belgium to 39.28% for Spain). In contrast, the lowest average figures of accounts receivable are seen in the Scandinavian countries (19.18% for Finland, and 25.70% for Sweden), followed by the UK with 28.58%. In addition, in an analysis by sectors in all countries, we see that the finance granted does differ from one sector to another, where the construction and wholesale sectors have high values, and the retail sector grants the least trade credit.

#### INSERT TABLE I

With regards the accounts payable, it is also Belgium, France, Greece, and Spain that exhibit higher levels of financing through suppliers (representing between 25% and 30% of liabilities). Likewise, in all the countries studied, firms in the wholesale and retail sectors make most use of this type of financing.

These differences on trade credit granted and received among countries are mainly explained, following Marotta (2005), by the fact that initial terms of payment in Mediterranean countries (France, Greece, Italy, Portugal and Spain) are much longer than in Nordic countries (Germany, Scandinavia), and not because of late payment in Mediterranean countries. In fact, Omiccioli (2004) shows that initial terms of payment in different European countries represent on average around three quarters of effective payment periods. These results are consistent with the *European Payment Index Report* (2007) <sup>iii</sup>. Moreover, the majority of companies do not apply penalties for late payment (Wilner, 2000 for the US, Pike and Cheng, 2001 for the UK, Marotta, 2005, for Italy).

Table I shows that on average the accounts receivable by firms exceeds the accounts payable. This is true for all countries and sectors, except for the retail sector, in which the firms are net receivers of trade credit.

Having analyzed the importance of financing between firms, and observed the different levels of trade credit exhibited by countries, we now examine whether the factors determining the levels of accounts receivable and payable differ between the countries considered.

## **4. THEORETICAL AND EMPYRICAL SPECIFICATION**

### **4.1 Variables description**

On the basis of the theoretical analysis presented in Section 2, and following mainly the study by Petersen and Rajan (1997), we study whether the particular characteristics of firms, such as the creditworthiness, availability and cost of financial resources, sales growth, price discrimination, and the quality of the products sold, can

explain both the decisions to grant credit to customers and to demand for credit from suppliers in European SMEs<sup>iv</sup>. In order to do that, we build the following variables. First, we present the dependent variables, followed by the variables which can be explanatory factors of both accounts receivable and payable, and finally variables which are considered to be determinants of accounts receivable or determinants of account payable, but not both.

The dependent variables have been built following Petersen and Rajan (1997). The first, accounts receivable (RECEIV), is calculated as the ratio of accounts receivable to sales. Firms with a higher value of RECEIV grant a higher proportion of the sales as trade credit to their customers. The second, accounts payable (PAYAB), is defined as the ratio of accounts payable to total assets, and captures the importance of trade credit in the financing of the firm's assets.

As far as the explanatory factors which could affect as accounts receivable and accounts payable, we first use the size and age of the SME to measure its credit capacity and reputation, and therefore its ability to access alternative sources of finance. LSIZE is calculated as the logarithm of the assets. Larger firms are considered to have better creditworthiness and consequently freer access to funds in the capital markets. Consequently, these firms will be better able to act as financial intermediaries, granting credit to firms with greater financial constraints (Schwartz, 1974). In addition, larger firms (LSIZE) will conceivably use less credit from their suppliers, since they can go to other sources of finance as a consequence of their credit capacity and reputation. However, Long *et al.* (1993) argue that larger firms will have better reputations, and hence less need to offer credit to their customers in order to guarantee their products.

Thus, the expected relation between LSIZE and RECEIV is not clear, while the expected relation between LSIZE and PAYAB is negative.

With regards to age, LAGE is defined as the logarithm of  $(1 + \text{age})$ , where age is the number of years since the firm was founded. This variable can be interpreted in much the same way as the size variable. Like Petersen and Rajan (1997), we introduce the variable LAGE squared to capture the declining effect that the passing of time has in old firms.

We should also take into account the availability of generate internal resources. Specifically, the variable CFLOW is defined as the ratio of net profits plus depreciation to sales, and is used as a proxy for the firm's capacity to generate internal resources. We would expect firms with greater capacity to generate internal funds to offer more finance to their customers. Conversely, a negative relationship between *cash flow* and PAYAB is expected, since firms that generate more internal finance will have less need to resort to credit from their suppliers. In that case, as PAYAB is calculated as a proportion of assets, we also divided net profits plus depreciation over assets ( $\text{CFLOW}_2$ ).

To control for the cost of external finance we use the variable FCOST, defined as the ratio of finance costs over the cost of external financing excluding trade creditors. As firms incur higher costs to obtain their resources they will have less incentive to grant financing to their customers and more incentives to demand financing from their suppliers, to the extent that this is possible. So, we expect FCOST to be related negatively with RECEIV and positively with PAYAB.

To capture the effect of possible shocks in the production and sales on the accounts receivable, we built the variables PGROWTH and NGROWTH. The first is

calculated from the yearly positive variations in the sales, and the second from the yearly negative variations in the sales. Although we would expect an increase in trade credit when firms are growing, the effect associated with declining sales is not as clear. According to the previous reasoning we would expect firms to offer less trade credit to their customers. But firms might also react by offering more trade credit, in an attempt to stem the fall in their level of operations (Petersen and Rajan, 1997). Indeed, as Emery (1987) demonstrated, trade credit can be used to stimulate sales in times of low demand. In this way, firms cut the costs generated by rising stock levels and changes in production levels. Moreover, firms with higher sales growth will have greater growth opportunities, so they will have an increased demand for funds and consequently for trade credit.

Finally, there are some variables which are considered to be explanatory of accounts receivable alone. First we include the short-term finance STLEV, which is calculated as the ratio of current liabilities to sales. We would expect firms that are able to obtain more short-term resources to be also able to grant more trade credit to their customers.

Trade credit can also be employed for the firm to transmit information about the quality of their products via the trade credit they grant. To measure this, we use the variable TURN, calculated as the ratio of sales to (assets minus accounts receivable). According to Long *et al.* (1993), this variable should have a negative relationship with the variable RECEIV, since firms with a lower sales turnover produce higher quality goods. This is due to the better quality controls, implying a prolonging of the production cycle. These firms will therefore offer more trade credit to their customers so that they can evaluate this quality.

The variable GPROF is calculated as the ratio of gross profit to sales. The variable aims to test whether firms with higher margins offer more trade credit. Following Petersen and Rajan (1997), we include the variable GPROF squared to moderate the effect of firms with high margins.

With reference to the additional variables which literature deems to be explanatory of accounts payable alone, we have included STFIND, LTDEBT, CURRAS and PURCH. Variable STFIND, measured as the ratio of short-term financial debt to assets, should be negatively related with the dependent variable, since access to short-term bank debt could reduce the need for trade credit, which normally has higher implicit interest rates (substitution effect). Following Deloof and Jegers (1999), we also include the variable LTDEBT, defined as the ratio of long-term debt to assets, to test whether there is a substitution effect between long-term debt and debt provided by the suppliers.

On the other hand, on the assumption that firms tend to match the maturity of their liabilities and the liquidity of their assets, we introduce the variable CURRAS, defined as the ratio of current assets to total assets. We would expect firms that have made a bigger investment in current assets to use more short-term finance in general, and more trade credit in particular.

The variable PURCH, measured as the ratio of purchases to assets, allows us to control for the quantity of credit offered by the sellers to their customers.

In Table II we report the average values of the variables described above for the different countries considered. As can be seen from Table II, firm size varies according to the country. On average, Belgian and Spanish firms have the most assets (more than €6 million). As far as age is concerned, French firms are the oldest (over 35 years),

while Greek firms barely exceed 12 years. It is also the Greek firms that take on the highest levels of short-term finance, generate more internal resources, and pay more for their outside finance. With regard to operational profitability, the best margins are obtained by the Greek firms (a gross profit of almost 9% of sales).

We should also highlight the weight of the current assets on the European firms' balance sheets, with the value of CURRAS ranging from 61% for Finnish firms to 74% for French ones. Long-term debt is relatively low, with Sweden and Finland (22% and 19%, respectively) being the countries that use this type of financing most. We also see that the use of short-term financial debt differs from country to country. Compared to Sweden and Finland, where this type of debt is barely used, we note that it represents almost 20% of the total financing of British firms.

INSERT TABLE II

#### 4.2 Model specification

To study the determinants of accounts receivable and accounts payable we estimate the following models using a panel data model:

*Model 1:*

$$\begin{aligned} \text{RECEIV}_{it} = & \beta_0 + \beta_1 \text{LSIZE}_{it} + \beta_2 \text{LAGE}_{it} + \beta_3 \text{LAGE}_{it}^2 + \beta_4 \text{CFLOW}_{it} + \beta_5 \text{STLEV}_{it} + \\ & \beta_6 \text{FCOST}_{it} + \beta_7 \text{PGROWTH}_{it} + \beta_8 \text{NGROWTH}_{it} + \beta_9 \text{TURN}_{it} + \beta_{10} \text{GPROF}_{it} + \\ & \beta_{11} \text{GPROF}_{it}^2 + \mu_i + \lambda_t + \varepsilon_{it} \end{aligned} \quad (1)$$

*Model 2:*

$$\begin{aligned} \text{PAYAB}_{it} = & \beta_0 + \beta_1 \text{LSIZE}_{it} + \beta_2 \text{LAGE}_{it} + \beta_3 \text{LAGE}_{it}^2 + \beta_4 \text{CFLOW}_{2it} + \beta_5 \text{STFIND}_{it} + \\ & \beta_6 \text{LTDEBT}_{it} + \beta_7 \text{FCOST}_{it} + \beta_8 \text{PGROWTH}_{it} + \beta_9 \text{NGROWTH}_{it} + \beta_{10} \text{CURRAS}_{it} + \\ & \beta_{11} \text{PURCH}_{it} + \mu_i + \lambda_t + \varepsilon_{it} \end{aligned} \quad (2)$$

where  $\text{RECEIV}_{it}$  represents the trade credit granted by firm  $i$  at time  $t$  to its customers and  $\text{PAYAB}_{it}$  the finance received by firm  $i$  at time  $t$  from its suppliers;  $\text{LSIZE}_{it}$  the size;  $\text{LAGE}_{it}$  the age of the company in years;  $\text{CFLOW}_{it}$  the cash flows generated by the firm;  $\text{STLEV}_{it}$  the short-term financing;  $\text{FCOST}_{it}$  the cost of outside financing;  $\text{PGROWTH}_{it}$  the positive sales growth;  $\text{NGROWTH}_{it}$  the negative sales growth;  $\text{TURN}_{it}$  the assets turnover;  $\text{GPROF}_{it}$  the gross profit margin,  $\text{STFIND}_{it}$  the short-term financing received from financial institutions;  $\text{LTDEBT}_{it}$  the long-term debt;  $\text{CURRAS}_{it}$  the investment in current assets; and  $\text{PURCH}_{it}$  the purchases made. In addition,  $\mu_i$  controls for the unobservable characteristics of each firm (the executives' management capacity, their personal skills, etc.), which are constant over time.  $\lambda_t$  are time dummy variables that change over time, but are equal for all the firms in each of the years considered. In this way, we attempt to capture certain economic factors (interest rates, prices, etc.) that vary over time and can possibly affect the decision to grant trade credit.  $\varepsilon_{it}$  are the random disturbances.

Our strategy is to test first whether individual effects exist, and, if so, to identify which is the best model to estimate them. We use the Breusch-Pagan (1980) test to identify the existence of individual effects. If we reject the null hypothesis of no unobserved heterogeneity, then a model capturing individual heterogeneity is appropriate. Thus, it is first necessary to determine if there is a correlation between the unobservable heterogeneity,  $\mu_i$ , of each firm, and the explanatory variables of the model. If there is a correlation (fixed effects), the consistent estimation would be



obtained by the within-group estimator. If there is not (random effects), a more efficient estimator can be obtained by estimating the equation in levels by generalized least squares (GLS). The usual strategy for the specification of the fixed or random nature of the effects is to apply the Hausman (1978) test under the null hypothesis  $E(\mu_i/x_{it}) = 0$ . If the null hypothesis is rejected, the effects are considered to be fixed, and the estimation of the model is carried out by ordinary least squares. If the null hypothesis is accepted, we would have the case of random effects, and the model would then be estimated by GLS. In this way, a more efficient estimator of  $\beta$  is obtained<sup>v</sup>.

## 5. RESULTS

In Table III we report the results obtained from the estimations of Model 1 for the different countries. In general, these results show that there are indeed certain aspects that affect the firm's decision to offer trade credit to its customers that are similar regardless of the firm's country of origin.

First, firm size is seen to be a determinant factor of the accounts receivable. Specifically, in all the countries analyzed, we found a positive relationship between size and trade credit granted. Thus, larger firms finance their customers more than small ones. This result was expected, since large firms can obtain finance more easily and hence can act as financial intermediaries. However, although our findings confirm Petersen and Rajan's (1997) results for the US market, they do not support the position taken by Long *et al.* (1993) with regards the trade credit granted to customers and the quality of the products sold.

In that respect, and contrary to Long *et al.* (1993), we did not observe a clear effect of age on the dependent variable. Only for Belgium and Sweden is the coefficient

associated with this variable significant at the 10% level, and, what is more, the sign obtained is different in each case. Thus, the age of the firm does not appear to affect the managers when taking decisions about offering trade credit to their customers.

We do confirm, in line with the findings for the size variable, that regardless of the SME's country of origin, greater access to short-term financing implies increased financing of customers. Moreover, and as we would expect, firms incurring higher costs for their finance reduce their intermediation activity, cutting the sales they finance to their customers. Thus, the firms are clearly channelling funds to the extent to which they are capable of obtaining resources at lower cost.

#### INSERT TABLE III

With regards the effect that the capacity to generate internal funds has on the granting of trade credit, the results obtained here show that the significance of this variable depends on the country being analyzed. Although, as expected, Finnish, French and Greek SMEs that generate more resources grant more trade credit to their customers, this result is not repeated for Spanish, Swedish or British firms. And a negative and significant relationship between the variables is found for Belgian firms, as has also been found in the American market.

On the other hand, the results for the growth variables do coincide for all the countries studied. Thus, and in contrast to earlier evidence from American SMEs (Petersen and Rajan, 1997), we find that in European countries there is generally an inverse relation between the sales growth and the variable RECEIV. This indicates that firms enjoying higher sales growth reduce the finance levels granted to their customers.

In contrast, and consistent with findings from the US, firms with negative sales growth raise the proportion of their financed sales. These results suggest that the firms are using trade credit as a marketing mechanism to improve their sales figures. If their sales have slow or negative growth, they resort more to this mechanism<sup>vi</sup>.

As far as the variable TURN is concerned, which is introduced to test Long *et al.*'s (1993) hypothesis of quality signalling, the results obtained – which are common to all the countries – do not allow us to support this idea. In fact, in contrast to what we would expect, it is the firms with highest turnover, which indicates that they produce goods whose quality is easiest to verify, which finance their sales most. However, this is consistent with the relation previously found between the dependent variable and size. Larger firms, and consequently those with more reputation (which intuitively do not need to transmit signals about the quality of their products by granting more trade credit), finance their customers more than smaller firms. Deloof and Jegers (1996), in a study of large Belgian firms, did not find evidence confirming the quality signalling theory either.

Furthermore, and as we expected, the weight of trade credit as a proportion of sales is positively related to the gross profit margin in the European countries. This supports Petersen and Rajan's (1997) argument that firms with higher margins are more ready to grant financing to their customers. Indeed, firms with higher margins will have more incentive to sell, even if they have to finance the sales to do so. The dilution of the effect that can occur if the margins generated are very high is detected for all the countries except Finland, Greece, and Spain. Thus, we conclude that firms use trade credit as a price discrimination mechanism. In this respect, we might suggest that the firm's interest in discriminating in favour of riskier customers when they decide to sell to them using trade credit lies not only in the short-term profit obtained, but also, and

more importantly, in the future profits to be gained from maintaining the commercial relationship with them.

Given that it is the variable CFLOW that shows most divergence between the countries analyzed, we now examine in more detail the effect of this variable on a firm's decision to finance their customers. With this in mind, we repeat the previous estimations, breaking down the internal resources generated into positive and negative cash flows (PCFLOW and NCFLOW)<sup>vii</sup>. The results obtained (Table IV) demonstrate the different effect that the capacity to generate internal flows has in the different countries. The relationship between the dependent variable and PCFLOW is similar to that found with CFLOW. Moreover, the greater detail provided by disaggregating CFLOW also allows us to see that for the British firms there is a relation between the internal cash flows and the accounts receivable, although it only holds when the cash flows generated are negative. Neither the signs nor the significance of the remaining variables change in this analysis.

#### INSERT TABLE IV

In Table V we report the results of the estimation of Model 2 for the different countries. First, we observe that the relation between the variables PAYAB and LSIZE is positive and significant for all the countries. Thus, and in contrast to what we expected, it is the larger firms, which normally have more possibility of obtaining external financing, that receive a higher proportion of their financing from their suppliers. In this respect, we note that a similar result was found in some of the estimations carried out by Petersen and Rajan (1997). This could be explained by

considering that the level of accounts payable is determined both by the financing demands that firms make and by the offers of trade credit that they receive. Hence we could suspect that larger firms, given their superior creditworthiness, will have more access to this type of financing.

#### INSERT TABLE V

The signs of the estimated coefficients of the age variable confirm the previous result to a large extent. In this case too it is the older firms that use financing from suppliers more than the younger ones. However, the results for this variable by country are not as homogeneous as those found for the variable LSIZE.

The results confirm a substitution effect between supplier-provided credit and other sources of financing. There is an inverse relation between the level of financing from suppliers and the resources generated internally by the firm. In all the firms analyzed, without exception, and in line with Petersen and Rajan's (1997) findings for small US firms, the firms generating more resources internally resort less to debt from suppliers. This can be explained by their reduced need for external funding. Moreover, we observe a negative relation between the dependent variable and the variable STFIND. Thus, the sample firms reduce their levels of debt from suppliers when they have the chance to access other short-term financial resources. And third, and as Deloof and Jegers (1999) found for large Belgian firms, there is a substitution effect between the dependent variable and the use of long-term debt. In all cases, these relationships can be explained by the high cost of financing from suppliers.

As in the model for the accounts receivable, we controlled for the cost of the external financing received. The result obtained – which was similar for all the countries – shows that firms increase their use of financing from suppliers when the financial

costs of other sources are higher. In addition, this finding adds consistency to the inverse relation found between the dependent variable and the proxies for the other financing options considered. Indeed, firms incurring higher costs in their external financing have more incentive to resort to trade credit.

On the other hand, for all the countries analyzed, we observe that the level of accounts payable is positively affected by the growth/decline in sales. Thus, firms with growth opportunities, which consequently have a higher demand for funds, rely on the support of their suppliers to finance this growth.

We also found in the sample of European firms studied here that firms match the maturity of short-term assets and liabilities. The relationship found between the variables PAYAB and CURRAS is positive, meaning that firms that invest more in current assets use more short-term financing such as trade credit.

Table VI reports the results obtained when we include a greater disaggregation of the current assets in the model proposed (Equation 2)<sup>viii</sup>. With this we attempt to analyze more explicitly the specific entry items that determine the demand for credit from suppliers. In general, the patterns of financing seen in the different countries are similar, with a positive relation between trade credit and investment in cash holdings, trade debtors and inventories. This result is in contrast to Deloof and Jegers (1999), who only found a significant relationship with cash holdings, but consistent with Chittenden and Bragg (1997) who showed a positive relationship between the trade credit cycle and investment in working capital. The results obtained for the rest of the variables are consistent with those reported in Table V.

Industry structures may have important effects on payment terms because of different trade credit cycles and different pricing policies. In fact, empirical evidence

shows that trade credit terms vary across industries but that there is little variation within industries (Petersen and Rajan, 1997; Ng. et al, 1999). Following this line of thought, all the estimations presented in Tables III, IV, V and VI were repeated in order to control for possible industry effects<sup>ix</sup>. We also introduced the economic cycle, by using GDP growth. The results remain unaltered in both the sign and significance of the variables.

INSERT TABLE VI

## **6. CONCLUSIONS**

Trade credit offered by suppliers is particularly important for small and medium-sized firms, in view of the greater difficulty they have in obtaining finance through credit institutions. Moreover, the level of trade credit granted and received varies across different European countries. In this research, the determinants of the trade credit granted and received in a sample of European SMEs was studied. We have attempted to determine whether factors that determine the level of trade credit differ among the European countries.

In spite of the differences in the levels of trade credit in different countries, our results show that the majority of explanatory factors of trade credit analyzed are common to the broad range of European countries studied. Most importantly, firms that have a greater capacity to obtain resources from the capital markets, and more cheaply, grant more trade credit to their customers. Indeed, larger firms (which have better creditworthiness), with greater access to short-term financial resources and cheaper external financing, finance their customers' purchases more than smaller firms. These results appear to support the theory that explains trade credit on the basis of suppliers'

advantages over financial intermediaries. However, the capacity to generate internal resources does not affect all countries equally. Although the effect is positive for Finland, France, and Greece, insofar as firms with greater capacity to generate internal funds grant more trade credit to their customers, in Belgium the relation is negative. In Spain, Sweden, and the UK no relationship was found.

The use of trade credit as a way of transmitting information about the quality of the firm's products does not appear to be confirmed in any of the countries. Firms with lower sales turnover (products of higher quality), and smaller firms (less reputation), grant less trade credit to their customers. But trade credit does represent an appropriate marketing mechanism. The results appear to support the price discrimination theory, since we find that firms with higher margins grant more trade credit. In addition, faced with a reduction in their sales, firms react by increasing the credit they grant in an attempt to stem falling sales.

With regard to the accounts payable, we find that the larger European SMEs (superior creditworthiness), and those with more growth opportunities, receive more financing from their suppliers. This type of finance also increases with a raised investment in cash holdings, trade debtors, and inventories. In contrast, the existence of alternative financial resources leads to a reduced recourse to financing from suppliers (substitution effect). The European SMEs use less trade credit when they have opportunities to obtain external financing at a lower cost, as well as when their capacity to generate internal resources increases.

Our results reveal that trade credit decisions taken by firms are affected, in general, by the same factors regardless the country in which they work. The differences on accounts receivable and payable among European countries are mainly explained by the different terms of payment. It may also be explained by the different financial



market structures across nations (Berger and Udell, 2006). That conclusion is especially interesting for firms operating in different countries, since our study shows the main factors they have to consider in order to establish their trade credit policy. Moreover, firms established in countries belonging to the continental model (Belgium, France, Greece and Spain), which exhibit the highest levels of trade credit granted and received, have to be particularly concerned with working capital management practices in order to reduce debtors' credit periods (Peel and Wilson, 1996).

Finally, for further research, when the required information is available, it would be interesting to complete the study of accounts payable taking into account the quantity of credit offered to the firms by their suppliers, as in the study by Petersen and Rajan (1997). Moreover, providing that bank market power appears to be associated with more dependence on trade credit (Carbó-Valverde et al. 2009), it would be attractive to analyse their effects on the trade credit across countries. It would also be interesting to evaluate whether there are differences in trade credit in countries with better loan guarantee programs which help SME to access bank debt (Nitani and Riding, 2005).

## NOTES

<sup>i</sup> For very many firms the database does not present the financial information which is required in our study.

<sup>ii</sup> Test for the difference in the mean between two specific countries (for example, Belgium-Finland, Belgium-France, Finland-France, etc) also indicates that difference are significant in all cases. All p-value=0.00 are not presented.

<sup>iii</sup> European Payment Index is a report based on a written survey carried out by *Intrum Justia* in 25 European countries on an annual basis involving several thousand companies.

<sup>iv</sup> Petersen and Rajan (1997) studied the accounts payable from two perspectives. They considered that firms' quantity of accounts payable depends on both the quantity of credit offered to them by their suppliers, and on the quantity of credit that they themselves demand. The first aspect cannot be analyzed in this current work since we lack information about the dependent variable used by these authors (purchases made on credit).

<sup>v</sup> If endogeneity problems were considered, according to modern econometric modeling, the estimation could be carried out using GMM (Generalized Method of Moments) which handles not only unobserved heterogeneity, but also potential endogeneity.

<sup>vi</sup> This result is unchanged if we introduce a single variable to measure sales growth (both positive and negative). Specifically, the sign of the estimated coefficient for that variable stays negative.

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vii PCFLOW is calculated as the ratio of the resources generated internally (net profits plus depreciation) to sales, when these resources are positive. NCFLOW is the ratio of the negative internal resources to sales.

viii We include CASH calculated as cash holdings over assets, RECEIV<sub>2</sub> as finance granted to customers over assets, and INVENT as inventory over assets.

ix As the analysis is carried out using the panel data methodology, the introduction of sectorial dummies is not possible. Thus, to carry out these estimations (whose results are not presented because of their similarity), we considered that the turnover of assets and the investment in current assets were a sectorial characteristic, so we subtract the sectorial mean from the variable TURN in model 1 and from the variable CURRAS in model 2.

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**Table I: Accounts receivable and accounts payable, by sectors**

Accounts receivable is calculated as ratio of trade debtors to assets. Accounts payable as ratio of trade creditors to assets. Both panels include p-value of an ANOVA in order to test whether means are different.

*Panel A: Mean values of accounts receivable, by sectors*

	<b>Belgium</b>	<b>Finland</b>	<b>France</b>	<b>Greece</b>	<b>Spain</b>	<b>Sweden</b>	<b>UK</b>	<b>p-value</b>
<b>Total accounts receivable</b>	0.3542	0.1918	0.3555	0.3655	0.3928	0.2570	0.2858	0.00
Agriculture	0.2744	0.1394	0.3374	0.3276	0.2468	0.1351	0.1445	0.00
Mining	0.3089	0.1406	0.3196	0.3842	0.3201	0.1196	0.2322	0.00
Manufacturing	0.3264	0.1881	0.3781	0.3673	0.3960	0.2406	0.2983	0.00
Construction	0.4233	0.2240	0.5176	0.3098	0.5727	0.3992	0.3300	0.00
Retail trade	0.2179	0.1181	0.1265	0.2787	0.2249	0.1333	0.1440	0.00
Wholesale trade	0.4107	0.2727	0.3988	0.4754	0.4548	0.3296	0.3655	0.00
Transport and public services	0.3473	0.1529	0.3693	0.4018	0.3854	0.1830	0.2482	0.00
Services	0.4082	0.1897	0.3013	0.2442	0.3343	0.2278	0.2810	0.00

*Panel B: Mean values of accounts payable, by sectors*

	<b>Belgium</b>	<b>Finland</b>	<b>France</b>	<b>Greece</b>	<b>Spain</b>	<b>Sweden</b>	<b>UK</b>	<b>p-value</b>
<b>Total accounts payable</b>	0.2700	0.1317	0.2852	0.2670	0.2488	0.1641	0.1913	0.00
Agriculture	0.2275	0.0872	0.2124	0.2337	0.1724	0.1448	0.1203	0.00
Mining	0.1954	0.1338	0.2300	0.1709	0.1468	0.0820	0.1381	0.00
Manufacturing	0.2392	0.1116	0.2661	0.2397	0.2204	0.1398	0.1866	0.00
Construction	0.3145	0.1244	0.3166	0.2101	0.3539	0.2086	0.2859	0.00
Retail trade	0.3018	0.2190	0.3442	0.3912	0.2966	0.2092	0.2196	0.00
Wholesale trade	0.2934	0.1988	0.3760	0.3477	0.2872	0.2030	0.2316	0.00
Transport and public services	0.2567	0.1012	0.1910	0.3019	0.2084	0.1027	0.1535	0.00
Services	0.2653	0.0936	0.1878	0.1911	0.1702	0.1367	0.1413	0.00

**Table II: Mean values of variables**

RECEIV finance conceded by firms to other companies and PAYAB finance received from suppliers; ASSET assets (in thousand €); AGE years company in operation; CFLOW cash flows generated; CFLOW<sub>2</sub> capacity to generate internal resources (calculated over assets); FCOST cost external financing; PGROWTH positive sales growth experienced; NGROWTH negative growth; STLEV short-term finance; TURN assets turnover; GPROF gross profit margin; STFIND short-term finance received from financial institutions; LTDEBT long-term debt; CURRAS investment in current assets; PURCH purchases made.

	<b>Belgium</b>	<b>Finland</b>	<b>France</b>	<b>Greece</b>	<b>Spain</b>	<b>Sweden</b>	<b>UK</b>
<b>RECEIV</b>	0.2019	0.0918	0.1807	0.3314	0.2653	0.1112	0.1468
<b>PAYAB</b>	0.2700	0.1317	0.2852	0.2671	0.2488	0.1641	0.1913
<b>ASSET</b>	6627.84	2486.88	2665.48	3677.68	6955.10	2096.72	5360.15
<b>AGE</b>	24.1004	18.1382	35.1517	12.9458	21.0702	20.5659	22.8162
<b>CFLOW</b>	0.0559	0.0802	0.0487	0.0853	0.0621	0.0480	0.0611
<b>CFLOW<sub>2</sub></b>	0.0919	0.1544	0.0934	0.0895	0.0860	0.0969	0.1011
<b>FCOST</b>	0.0363	0.0351	0.0424	0.0891	0.0616	0.0365	0.0374
<b>PGROWTH</b>	0.1154	0.1870	0.1184	0.2196	0.1552	0.1761	0.1702
<b>NGROWTH</b>	-0.0397	-0.0334	-0.0259	-0.0406	-0.0253	-0.0372	-0.0388
<b>STLEV</b>	0.3332	0.2120	0.2920	0.5099	0.3489	0.2008	0.3124
<b>TURN</b>	3.6546	3.1393	4.1729	2.8476	3.6759	4.0223	3.6722
<b>GPROF</b>	0.0314	0.0715	0.0387	0.0885	0.0538	0.0436	0.0392
<b>STFIND</b>	0.0971	0.0330	0.0740	0.1719	0.1499	0.0147	0.1933
<b>LTDEBT</b>	0.1354	0.1997	0.0998	0.0549	0.1000	0.2225	0.1147
<b>CURRAS</b>	0.7142	0.6123	0.7486	0.6807	0.6948	0.6852	0.6656
<b>PURCH</b>	1.1588	1.1576	1.0384	0.9690	1.2026	1.2404	1.5460

**Table III: Determinants of accounts receivable (I)**

RECEIV finance conceded by firms to other companies; LSIZE log (assets); LAGE log (1+ years company in operation); CFLOW cash flows generated; STLEV short-term finance; FCOST cost external financing; PGROWTH positive sales growth experienced; NGROWTH negative growth; TURN assets turnover; GPROF gross profit margin. Results obtained by fixed effects estimation. Coefficients of time dummies not reported.

	Belgium	Finland	France	Greece	Spain	Sweden	UK
<b>LSIZE<sub>it</sub></b>	0.0396*** (18.00)	0.0235*** (16.53)	0.0413*** (22.80)	0.0465*** (13.89)	0.0388*** (16.52)	0.0235*** (18.46)	0.0175*** (16.11)
<b>LAGE<sub>it</sub></b>	0.0474* (1.89)	-0.0190 (-1.13)	0.0641 (1.23)	0.0504 (1.15)	-0.0395 (-1.47)	-0.0287* (-1.81)	-0.0085 (-0.65)
<b>LAGE<sub>it</sub><sup>2</sup></b>	-0.0162** (-2.08)	0.0030 (0.53)	-0.0190 (-1.57)	-0.0101 (-0.61)	0.0138 (1.60)	0.0052 (1.00)	-0.0032 (-0.76)
<b>CFLOW<sub>it</sub></b>	-0.0522*** (-3.57)	0.0443*** (3.88)	0.0398*** (3.14)	0.0563*** (5.18)	0.0030 (0.19)	0.0035 (0.35)	0.0000 (-0.04)
<b>STLEV<sub>it</sub></b>	0.1857*** (40.40)	0.1540*** (32.81)	0.2772*** (58.21)	0.2784*** (56.05)	0.3494*** (70.64)	0.2242*** (48.16)	0.1089*** (43.94)
<b>FCOST<sub>it</sub></b>	-0.1297*** (-4.39)	-0.1098*** (-5.66)	-0.3097*** (-19.58)	-0.0118 (-0.74)	-0.1982*** (-13.09)	-0.1395*** (-7.91)	-0.1647*** (-12.18)
<b>PGROWTH<sub>it</sub></b>	-0.0061*** (-2.91)	-0.0038*** (-3.96)	-0.0231*** (-11.75)	-0.0088*** (-4.40)	-0.0083*** (-5.71)	-0.0044*** (-6.05)	-0.0012 (-1.23)
<b>NGROWTH<sub>it</sub></b>	-0.0696*** (-13.02)	-0.0330*** (-7.84)	-0.0477*** (-9.88)	-0.1166*** (-12.72)	-0.0879*** (-14.35)	-0.0253*** (-7.57)	-0.0204*** (-6.81)
<b>TURN<sub>it</sub></b>	0.0052*** (20.29)	0.0079*** (27.18)	0.0123*** (51.10)	0.0072*** (15.99)	0.0063*** (27.91)	0.0049*** (31.56)	0.0009*** (15.41)
<b>GPROF<sub>it</sub></b>	0.0948*** (6.39)	0.0246** (2.33)	0.1020*** (8.42)	0.0383*** (2.94)	0.0609*** (3.95)	0.0388*** (5.47)	0.0311*** (6.88)
<b>GPROF<sub>it</sub><sup>2</sup></b>	-0.2083*** (-3.20)	-0.0084 (-0.21)	-0.2540*** (-3.90)	-0.0076 (-0.23)	-0.0202 (-0.34)	-0.0505* (-1.68)	-0.0961*** (-5.65)
<b>C</b>	-0.2028*** (-8.33)	-0.1062*** (-8.03)	-0.2330*** (-5.01)	-0.2728*** (-8.72)	-0.2033*** (-8.01)	-0.0769*** (-5.95)	0.0257** (2.28)
<i>P-Breusch-Pagan</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>P-Hausman</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Firms</i>	4276	3572	5812	5458	8990	7906	11183
<i>Observations</i>	19554	15607	26145	23079	29967	26481	44324

t-statistic in parentheses.

\* significant at 90%; \*\* significant at 95%; \*\*\* significant at 99%

P-Breusch-Pagan is the p-value in Breusch-Pagan's (1980) test. If the null hypothesis is rejected individual effects are present in the data.

P-Hausman is p-value of Hausman (1978) test. If the null hypothesis rejected, only within-group estimation is consistent. If accepted, estimation by random effects is the best option, since it is consistent and also more efficient than the within-group estimator.



**Table IV: Determinants of accounts receivable (II)**

RECEIV finance conceded by firms to other companies; LSIZE log (assets); LAGE log (1+ years company in operation); PCFLOW positive cash flows generated; NCFLOW negative cash flows generated; STLEV short-term finance; FCOST cost external financing; PGROWTH positive sales growth experienced; NGROWTH negative growth; TURN assets turnover; GPROF gross profit margin. Results obtained by fixed effects estimation. Coefficients of time dummies not reported.

	Belgium	Finland	France	Greece	Spain	Sweden	UK
<b>LSIZE<sub>it</sub></b>	0.0396*** (18.00)	0.0235*** (16.53)	0.0411*** (22.72)	0.0471*** (14.059)	0.0388*** (16.51)	0.0235*** (18.45)	0.0173*** (15.91)
<b>LAGE<sub>it</sub></b>	0.0474* (1.89)	-0.0190 (-1.13)	0.0657 (1.26)	0.0492 (1.13)	-0.0395 (-1.47)	-0.0286* (-1.80)	-0.0087 (-0.66)
<b>LAGE<sub>it</sub><sup>2</sup></b>	-0.0162* (-2.08)	0.0030 (0.53)	-0.0193 (-1.60)	-0.0098 (-0.60)	0.0138 (1.60)	0.0052 (1.00)	-0.0031 (-0.73)
<b>PCFLOW<sub>it</sub></b>	-0.0469*** (-2.74)	0.0442*** (3.59)	0.0239* (1.68)	0.0939*** (6.79)	0.0031 (0.18)	0.0114 (0.98)	-0.0003 (-0.36)
<b>NCFLOW<sub>it</sub></b>	-0.0698** (-2.15)	0.0451 (1.23)	0.1184*** (3.42)	-0.0461* (-1.79)	0.0025 (0.06)	-0.0250 (-1.05)	0.0484*** (3.71)
<b>STLEV<sub>it</sub></b>	0.1856*** (40.35)	0.1540*** (32.80)	0.2775*** (58.26)	0.2771*** (55.70)	0.3494*** (70.63)	0.2242*** (48.15)	0.1095*** (44.10)
<b>FCOST<sub>it</sub></b>	-0.1302*** (-4.41)	-0.1098*** (-5.66)	-0.3097*** (-19.58)	-0.0127 (-0.79)	-0.1982*** (-13.09)	-0.1400*** (-7.94)	-0.1638*** (-12.11)
<b>PGROWTH<sub>it</sub></b>	-0.0061*** (-2.90)	-0.0038*** (-3.95)	-0.0231*** (-11.74)	-0.0090*** (-4.48)	-0.0083*** (-5.71)	-0.0044*** (-6.02)	-0.0011 (-1.14)
<b>NGROWTH<sub>it</sub></b>	-0.0695*** (-13.01)	-0.0330*** (-7.83)	-0.0481*** (-9.95)	-0.1149*** (-12.53)	-0.0879*** (-14.34)	-0.0252*** (-7.56)	-0.0204*** (-6.81)
<b>TURN<sub>it</sub></b>	0.0052*** (20.30)	0.0079*** (27.15)	0.0123*** (51.03)	0.0072*** (16.05)	0.0063*** (27.90)	0.0049*** (31.59)	0.0009*** (15.39)
<b>GPROF<sub>it</sub></b>	0.0965*** (6.39)	0.0246** (2.24)	0.0949*** (7.61)	0.0492*** (3.71)	0.0609*** (3.80)	0.0406*** (5.62)	0.0210*** (3.98)
<b>GPROF<sub>it</sub><sup>2</sup></b>	-0.2308*** (-3.08)	-0.0079 (-0.18)	-0.1755** (-2.42)	-0.0728** (-2.02)	-0.0206 (-0.30)	-0.0741** (-2.12)	-0.0656*** (-3.47)
<b>C</b>	-0.2034*** (-8.35)	-0.1062*** (-8.03)	-0.2324*** (-4.99)	-0.2781*** (-8.89)	-0.2033*** (-8.01)	-0.0773*** (-5.98)	0.0267** (2.37)
<i>P-Breusch-Pagan</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>P-Hausman</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Firms</i>	4276	3572	5812	5458	8990	7906	11183
<i>Observations</i>	19554	15607	26145	23079	29967	26481	44324

t-statistic in parentheses.

\* significant at 90%; \*\* significant at 95%; \*\*\* significant at 99%

P-Breusch-Pagan is the p-value in Breusch-Pagan's (1980) test. If the null hypothesis is rejected individual effects are present in the data.

P-Hausman is p-value of Hausman (1978) test. If the null hypothesis rejected, only within-group estimation is consistent. If accepted, estimation by random effects is the best option, since it is consistent and also more efficient than the within-group estimator.

**Table V: Determinants of accounts payable (I)**

PAYAB finance received from suppliers; LSIZE log (asset); LAGE log (1+ years company in operation); CFLOW<sub>2</sub> capacity to generate internal resources (calculated over assets); STFIND short-term finance received from financial institutions; LTDEBT long-term debt; FCOST cost external finance; PGROWTH and NGROWTH positive and negative sales growth; CURRAS investment in current assets; PURCH purchases made. Results obtained by fixed effects estimation. Coefficients of time dummies not reported.

	Belgium	Finland	France	Greece	Spain	Sweden	UK
<b>LSIZE<sub>it</sub></b>	0.0471*** (16.51)	0.0152*** (6.65)	0.0457*** (19.55)	0.0345*** (14.00)	0.0396*** (16.69)	0.0192*** (9.08)	0.0129*** (7.84)
<b>LAGE<sub>it</sub></b>	0.0744** (2.24)	0.0603** (2.17)	0.0431 (0.61)	-0.0884*** (-2.78)	0.0741*** (2.69)	0.0096 (0.36)	0.0402** (2.03)
<b>LAGE<sub>it</sub><sup>2</sup></b>	-0.0391*** (-3.79)	-0.0257*** (-2.73)	-0.0340** (-2.07)	0.0108 (0.90)	-0.0425*** (-4.81)	-0.0119 (-1.37)	-0.0255*** (-4.01)
<b>CFLOW<sub>2it</sub></b>	-0.2567*** (-27.21)	-0.1601*** (-23.99)	-0.2830*** (-38.50)	-0.2355*** (-29.00)	-0.2368*** (-26.64)	-0.1268*** (-20.83)	-0.0087*** (-8.00)
<b>STFIND<sub>it</sub></b>	-0.3077*** (-38.48)	-0.1001*** (-7.67)	-0.2700*** (-38.45)	-0.3818*** (-51.37)	-0.3484*** (-58.10)	-0.1979*** (-12.52)	-0.1670*** (-46.47)
<b>LTDEBT<sub>it</sub></b>	-0.3032*** (-35.72)	-0.1166*** (-19.09)	-0.2274*** (-35.17)	-0.3368*** (-29.81)	-0.2654*** (-39.14)	-0.1604*** (-31.46)	-0.1461*** (-27.29)
<b>FCOST<sub>it</sub></b>	0.8029*** (20.42)	0.5394*** (16.64)	0.6693*** (30.75)	0.1724*** (14.69)	0.5000*** (31.64)	0.7712*** (25.73)	0.5150*** (25.52)
<b>PGROWTH<sub>it</sub></b>	0.0288*** (10.18)	0.0029* (1.81)	0.0353*** (13.15)	0.0158*** (10.77)	0.0131*** (8.77)	0.0071*** (5.79)	0.0130*** (9.31)
<b>NGROWTH<sub>it</sub></b>	0.0672*** (9.41)	0.0516*** (7.39)	0.0847*** (12.96)	0.0297*** (4.47)	0.0995*** (15.54)	0.0452*** (8.10)	0.0302*** (6.90)
<b>CURRAS<sub>it</sub></b>	0.1249*** (15.64)	0.0742*** (11.44)	0.1298*** (19.53)	0.0959*** (12.92)	0.1289*** (21.85)	0.0858*** (15.64)	0.0942*** (18.98)
<b>PURCH<sub>it</sub></b>	0.0136*** (6.09)	0.0168*** (10.55)	-0.0012 (-0.68)	0.0190*** (8.11)	0.0135*** (8.10)	0.0025* (81.95)	0.0142*** (13.37)
<b>C</b>	-0.0361 (-1.08)	0.0389* (1.72)	0.1241* (1.95)	0.1497*** (6.11)	0.0259 (0.95)	0.0590** (2.43)	0.1425*** (8.01)
<i>P-Breusch-Pagan</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>P-Hausman</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Firms</i>	4276	3572	5812	5458	8990	7907	10087
<i>Observations</i>	19554	15607	26145	23079	26967	26506	39328

t-statistic in parentheses.

\* significant at 90%; \*\* significant at 95%; \*\*\* significant at 99%

P-Breusch-Pagan is the p-value in Breusch-Pagan's (1980) test. If the null hypothesis is rejected individual effects are present in the data.

P-Hausman is p-value of Hausman (1978) test. If the null hypothesis rejected, only within-group estimation is consistent. If accepted, estimation by random effects is the best option, since it is consistent and also more efficient than the within-group estimator.

**Table VI: Determinants of accounts payable (II)**

PAYAB finance received from suppliers; LSIZE log (asset); LAGE log (1+ years company in operation); CFLOW<sub>2</sub> capacity to generate internal resources (calculated over assets); STFIND short-term finance received from financial institutions; LTDEBT long-term debt; FCOST cost external finance; PGROWTH and NGROWTH positive and negative sales growth; CASH cash holdings level; RECEIV<sub>2</sub> finance granted to customers (over assets); INVENT inventory; PURCH purchases made. Results obtained by fixed effects estimation. Coefficients of time dummies not reported.

	Belgium	Finland	France	Greece	Spain	Sweden	UK
<b>LSIZE<sub>it</sub></b>	0.0500*** (17.60)	0.0172*** (7.60)	0.0507*** (21.29)	0.0364*** (14.82)	0.0410*** (17.30)	0.0202*** (9.15)	0.0168*** (9.81)
<b>LAGE<sub>it</sub></b>	0.0584* (1.77)	0.0450 (1.63)	0.0410 (0.56)	-0.0880*** (-2.78)	0.0706** (2.56)	0.0197 (0.72)	0.0111 (0.54)
<b>LAGE<sub>it</sub><sup>2</sup></b>	-0.0352*** (-3.43)	-0.0207*** (-2.22)	-0.0353** (-2.10)	0.0095 (0.79)	-0.0422*** (-4.78)	-0.0151* (-1.70)	-0.0165** (-2.51)
<b>CFLOW<sub>2it</sub></b>	-0.2550*** (-27.15)	-0.1481*** (-21.83)	-0.2657*** (-34.83)	-0.2267*** (-28.02)	-0.2246*** (-25.22)	-0.1248*** (-19.70)	-0.0074*** (-6.86)
<b>STFIND<sub>it</sub></b>	-0.3148*** (-39.30)	-0.1157*** (-8.99)	-0.2892*** (-40.11)	-0.3817*** (-51.64)	-0.3608*** (-59.57)	-0.2103*** (-12.87)	-0.1683*** (-44.59)
<b>LTDEBT<sub>it</sub></b>	-0.3044*** (-36.80)	-0.1184*** (-19.92)	-0.2373*** (-37.23)	-0.3362*** (-30.15)	-0.2562*** (-37.57)	-0.1760*** (-34.12)	-0.1512*** (-28.13)
<b>FCOST<sub>it</sub></b>	0.7842*** (20.06)	0.5156*** (16.13)	0.6130*** (27.63)	0.1645*** (14.11)	0.4865*** (30.79)	0.7598*** (24.60)	0.4667*** (22.51)
<b>PGROWTH<sub>it</sub></b>	0.0289*** (10.25)	0.0025 (1.58)	0.0346*** (12.77)	0.0162*** (11.07)	0.0128*** (8.59)	0.0082*** (6.48)	0.0106*** (7.32)
<b>NGROWTH<sub>it</sub></b>	0.0574*** (8.06)	0.0433*** (6.26)	0.0803*** (12.07)	0.0310*** (4.69)	0.0943*** (14.74)	0.0404*** (6.98)	0.0211*** (4.66)
<b>CASH<sub>it</sub></b>	0.0344*** (3.68)	0.0020 (0.28)	0.0182*** (2.73)	0.0487*** (5.76)	0.0612*** (8.28)	0.0120* (1.92)	-0.0221*** (-4.37)
<b>RECEIV<sub>2it</sub></b>	0.2070*** (24.76)	0.1519*** (19.87)	0.1346*** (20.37)	0.1147*** (15.46)	0.1548*** (23.32)	0.1245*** (19.71)	0.1269*** (26.24)
<b>INVENT<sub>it</sub></b>	0.0948*** (8.66)	0.0788*** (9.51)	0.1336*** (15.51)	0.1799*** (16.49)	0.1880*** (22.13)	0.0806*** (10.46)	0.1445*** (21.03)
<b>PURCH<sub>it</sub></b>	0.0073*** (3.23)	0.0151*** (9.60)	-0.0022 (-1.27)	0.0158*** (6.75)	0.0127*** (7.60)	-0.0004 (-0.27)	0.0103*** (9.29)
<b>C</b>	-0.0478 (-1.44)	0.0279 (1.26)	0.1333** (2.03)	0.1309*** (5.37)	0.0079 (0.29)	0.0682*** (2.73)	0.1266*** (6.93)
<i>P-Breusch-Pagan</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>P-Hausman</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Firms</i>	4264	3564	5781	5458	8957	7755	9799
<i>Observations</i>	19303	15524	25346	23078	29763	25135	36341

t-statistic in parentheses.

\* significant at 90%; \*\* significant at 95%; \*\*\* significant at 99%

P-Breusch-Pagan is the p-value in Breusch-Pagan's (1980) test. If the null hypothesis is rejected individual effects are present in the data.

P-Hausman is p-value of Hausman (1978) test. If the null hypothesis rejected, only within-group estimation is consistent. If accepted, estimation by random effects is the best option, since it is consistent and also more efficient than the within-group estimator.