TRADE CREDIT AND SMEs PROFITABILITY

Cristina Martínez-Sola[a], Pedro J. García-Teruel[b], Pedro Martínez-Solano[c, *]

[a] University of Jaén, Faculty Social Sciences and Law, Dpt. Of Accounting and Finance, Jaén (SPAIN), tel.: +34 953211957, fax: +34 953211869, email: mmsola@ujaen.es

[b] University of Murcia, Faculty of Economics and Business, Dpt. Management and Finance, Campus Universitario de Espinardo, 30100-Murcia (SPAIN), tel: +34 868 887828, fax:+34 868 887537, email: pjteruel@um.es

[c] University of Murcia, Faculty of Economics and Business, Dpt. Management and Finance, Campus Universitario de Espinardo, 30100-Murcia (SPAIN), tel: +34 868 883747, fax:+34 868 887537, email: pmsolano@um.es
[*]Corresponding author

ABSTRACT

Financial literature has discussed in depth the motives for trade credit provision by suppliers. However there is no empirical evidence of the effect of granting trade credit on small and medium sized firms' profitability. We examine the profitability implications of providing financing to customers for a sample of 11,337 Spanish manufacturing SMEs during the period 2000-2007. This paper also explains the differences in the profitability of trade credit according to financial, operational, and commercial motives. The findings suggest that managers can improve firm profitability by increasing their investment in receivables, and that the effect is greater for financially unconstrained firms (larger and more liquid firms), for firms with volatile demand, and for firms with bigger market share.

***Keywords*:** accounts receivable, trade credit, profitability, SMEs.

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1. INTRODUCTION

Investment in accounts receivable is an important part of a firm's balance sheets. On average a quarter of total assets for European countries are invested in accounts receivable (Giannetti, 2003), while this amount is even higher in the case of European small and medium size firms (García-Teruel and Martínez-Solano, 2010). These important levels of trade credit granted by firms to customers can have important implications for firm value and profitability (Pike and Cheng, 2001). Lewellen et al. (1980) demonstrated theoretically that the presence of market imperfection implies that trade credit decisions may affect the value of the firm.

Literature on trade credit granted focuses on determining factors (Deloof and Jegers, 1996, 1999; Elliehausen and Wolken, 1993; García-Teruel and Martínez-Solano, 2010; Long et al. 1993; Ng et al. 1999; Niskanen and Niskanen, 2006; Petersen and Rajan, 1997; Pike et al. 2005; Wilson and Summers, 2002, among others); on financial factors (Mian and Smith, 1992, Schwartz, 1974), operational (Emery, 1987, Ferris, 1981) and on commercial motives (Brennan et al. 1988; Nadiri, 1969; Smith, 1987). However, financial literature analysing the effect of trade credit policy on firm profitability and value remains scarce. García-Teruel and Martínez-Solano (2007) study working capital effect on firms' profitability and analyse the impact of the days accounts receivable, but they do not focus on investment in trade credit. To our knowledge, the only research examining this relation is Hill et al. (2012), who study the shareholder wealth implications of corporate trade credit investment for a sample of US listed firms. Trade credit effects on SMEs profitability remain unexplored, despite the relatively greater effect of accounts receivable on the assets of these firms compared to large firms. In fact, problems of asymmetric information and greater difficulty in accessing capital markets mean trade credit is more intensive in SMEs (Berger and Udell, 1998; Petersen and Rajan, 1997).

The aim of the current paper is twofold: to provide empirical evidence of the effect of granting trade credit on SMEs' profitability, and to study whether profitability from granting trade credit differs according to a firm's characteristics. We set up a panel of 11,337 small to medium-sized Spanish businesses during the period 2000 to 2007. Spanish SMEs provide an excellent setting for the purpose of this study. Firms operating in countries with more developed banking systems grant more trade credit to their customers (Demirgüç-Kunt and Maksimovic, 2002). This is the case of the Spanish market, which has one of the longest trade credit periods in Europe (Marotta, 2001). Moreover, Spanish SMEs have a greater preponderance of smaller firms than northern European and Scandinavian countries (Mulhern, 1995).

The results of this study provide empirical evidence of a linear relation between trade receivables and profitability of SMEs, which implies that the benefits of supplier financing outweigh the costs associated with trade credit. Furthermore, the effect of receivables on firm profitability differs depending on certain firms' characteristics. According to the financial motive for trade credit, larger and more creditworthy (financially unconstrained) firms will extend trade credit to their smaller customers (Schwartz, 1974), so increasing sales and generating an implicit rate of return. In this sense, we find that unconstrained firms, e.g., larger and more liquid firms, obtain higher returns on receivables compared to smaller and less liquid firms. The operational motive for trade credit predicts that firms with variable demand will extend more

trade credit than firms with relatively stable demand. We find evidence consistent with the view that trade credit help firms to smooth demand, since our results show higher profitability of receivables for the subsample of uncertain demand firms than for stable demand firms. Nevertheless, our results are, in some sense, contrary to the commercial motive for trade credit. We do not find that it is more profitable for firms without an established reputation to extend trade credit, nor is this so for smaller market share firms.

This research provides valuable insights for managers since the results suggest that by increasing the investment in trade credit, SMEs can enhance their profitability, especially for financially unconstrained firms, firms with volatile demand and firms with more market share.

The remainder of the article is organized as follows. In the next section, we review the trade credit literature and discuss predictions for the relations between the supply of trade credit and firm profitability. Section 3 describes the sample, variables and methodology. In section 4, we report the results, and section 5 concludes.

2. REVIEW OF LITERATURE

2.1 Trade credit-profitability relationship

The first research question we try to answer is whether trade credit increases profitability. There are many reasons that lead suppliers to extend credit. Chiefly, granting trade credit enhances firm's sales and consequently may result in higher profitability. Meltzer (1960) states that a primary function of trade credit is to mitigate customers' financial frictions, thus facilitating increased sales and market share growth (Nadiri, 1969). In addition to resolving financing frictions, trade credit can boost sales by alleviating informational asymmetry between suppliers and buyers in terms of product quality (Long et al. 1993; Smith, 1987). In this sense, the seller's investment in trade credit facilitates exchange by reducing uncertainty about product quality. Trade credit also enables price discrimination (Brennan et al. 1988); by varying the period of credit or the discount for prompt payment, firms can sell their products at different prices depending on the demand elasticity of customers. In a long-term perspective, trade credit might give future profits by establishing and maintaining permanent commercial relations (Ng et al. 1999; Wilner, 2000). In addition to increasing sales, trade credit may increase revenues through implicit interest rates (Emery, 1984), or it may reduce operating and transaction costs (Emery, 1987; Ferris, 1981). However, the provision of trade credit entails negative effects such as default risk or late payment, which may damage firm profitability. Moreover, extending supplier financing involves administrative costs associated with the granting and monitoring process, as well as transaction costs for converting receivables into cash (Emery 1984; Kim and Atkins, 1978; Sartoris and Hill, 1981). Furthermore, carrying receivables on the balance sheet implies direct financing and opportunity costs, so reducing the funds available for expansion projects.

Theoretical models argue that there is an optimal trade credit policy (Emery, 1984; Nadiri, 1969; Lewellen et al. 1980). Lewellen et al. (1980) demonstrated that trade credit can be used to increase firm value when

financial markets are imperfect, so implying an optimal trade credit policy. Likewise, Emery (1984) argues that the optimal level of accounts receivable occurs when the marginal revenue of trade credit is equal to the marginal cost. Consequently, one might expect a non-monotonic (concave) relationship between trade credit and firm value determined by a tradeoff between the costs and benefits of supplying trade credit, where there is a level of trade credit granted which maximizes firm value (Lewellen et al. 1980). However, these theoretical models do not find empirical support for a non-monotonic relationship. Instead, when studying listed US firms Hill et al. (2012) find a linear relation between trade credit and firm value, where the benefits of granting trade credit surpass the costs.

This linear effect between trade credit policy and firm value may be more evident for the case of SMEs. Cheng and Pike (2003) find that firms operating in competitive markets are forced to offer industry credit terms. Moreover SMEs usually have less bargaining power and need to guarantee the quality of the products they sell. In this sense, SMEs could be forced to grant trade credit despite the costs associated, since not to do so would lead to loss of sales, and lower profitability. Furthermore, firms may use trade credit policies that are related to their target growth rates; a firm willing to grow may choose a strategy of extending more trade than its competitors (Niskanen and Niskanen, 2006). Since SMEs usually are high growth firms, they can employ trade credit terms as a competitive tool to continue to increase sales. Based on the above, we test the following hypothesis:

H_1: The profitability in SMEs is positively related with the investment in trade credit

2.2 Trade credit motives and firm profitability

According to the financial literature, firms may extend credit to their customers for financial, operational and commercial motives. In this section we review the implications of trade credit motives on firms' profitability.

Schwartz (1974) developed the financial motives for the use of trade credit. He suggests that when credit is tight, financially stable firms will increasingly offer more trade credit to maintain their relations with smaller customers, who are "rationed" from direct credit market participation. The seller firm acts as a financial intermediary to customers with limited access to capital markets, so financing their customers' growth. Larger firms are thought to be better known and have better access to capital markets than smaller firms, in terms of availability and cost, and should therefore face fewer constraints when raising capital to finance their investments (Faulkender and Wang, 2006). Hence, the financial motive predicts a positive connection between extending trade credit and firm size (Mian and Smith, 1992; Petersen and Rajan, 1997; Schwartz, 1974).

On the other hand, according to Emery (1984) the objective of the financial motive for extending trade credit is to maximize the rate of return on the liquid reserve. Therefore, sellers may grant credit if the

implicit rate of return[1] earned on receivables exceeds that of other investments, so assuming a financial intermediary`s role of providing funds to borrowers. The existence of financial market imperfections allows vendor firms information and collection cost advantages over financial intermediaries. Thus, suppliers can afford to lend to customers at a cheaper rate than banks (Fabbri and Menichini, 2010). In addition to obtaining a return from trade credit, liquid suppliers can optimize sales by financing the growth of less-liquid buyers or customers with limited capital market access (Meltzer, 1960; Schwartz, 1974). Cuñat (2007) argues that granting trade credit, especially when customers experience temporally liquidity shocks that may threaten their survival, could reinforce the supplier-customer relationship. Hence, more liquid firms will grant trade credit to firms with low liquidity as an alternative to investing in marketable securities, as well as mitigating buyers' financial constraints (Emery, 1984; Petersen and Rajan, 1997). Consequently, according to the financial motive, we establish the following hypothesis:

H_2: The profitability of trade credit is higher for larger and more liquid firms.

Emery (1987) focuses on operational motive, addressing the role of variable product demand in a firm's operating decisions. According to this, firms may use trade credit to accommodate variable demand, which in turn could increase a seller's wealth because of the reduction in operating costs. As demand fluctuates, sellers face two alternatives: either they can allow the selling price to fluctuate so that the market always clears, or they can vary production to match demand. Either option is quite costly. If the price varies, potential buyers face extremely high costs of information search. If production varies, sellers face extremely high production costs (Long et al. 1993). Trade credit could, therefore, help to smooth irregular demand by stimulating sales through relaxing trade credit terms in slack demand periods (Emery 1984, 1988; Nadiri, 1969). Since the operational motive predicts that unstable demand firms grant more trade credit (Long et al. 1993), we test the next hypothesis:

H_3: The profitability of trade credit is higher for firms with variable demand than for firms with stable demand.

Lastly, from a commercial perspective, Nadiri (1969) argues that availability of alternative payment terms can expand the market by increasing product demand. According to the commercial motive, trade credit improves product marketability by facilitating firm's sales. Hill et al. (2012) argue that for firms with less market share (less market power) trade credit should prove more beneficial, as these firms have stronger incentives to increase sales. Moreover, continuing with the commercial motive, smaller firms that have worse reputations need to use more trade credit in order to guarantee their products (Long et al. 1993).

Hence, for small firms with a low market share, trade credit may be a necessary marketing tool, because in addition to guaranteeing product quality through the credit period, it may also provide a way to offer

[1] In trade credit arrangements it is very common to offer early payment discount to the customer. The most common payment term is 2/10, net 30 (Ng et al. 1999), by which a customer takes 2 percent discount on the purchase price if the payment is made within ten days; otherwise the payment is in full within thirty days. This translates as over 40 percent annual rate.

preferential terms to attract new customers. However, this does not necessarily imply higher profitability. As Wilson and Summers (2002) state, trade credit for small growing firms is a necessity rather than an option, since a new entrant firm should offer competitive terms to be successful. So, for larger market share firms it may be more beneficial to grant trade credit because, due to their dominant market position, they have many advantages in trade credit extension, such as greater ability to enforce contracts and to evaluate customers` credit risks, and more flexibility in credit terms offered. These contrasting arguments mean we cannot make a clear prediction for the result expected.

3. DATA, VARIABLES & METHODOLOGY

3.1 Data

The financial and accounting data used in this study were obtained from the SABI database (System of Iberian Financial Statement Analysis), made by Bureau Van Dijk. This database provides company financial statements, ratios, activities and information on managers and ownership structure for more than 1,250,000 Spanish businesses and some 400,000 Portuguese firms. Therefore, it is the reference database for Spanish samples used in most studies of SMEs (Baños-Caballero et al. 2012; Garcia-Tabuenca and Crespo-Espert, 2010; López-Gracia and Sogorb-Mira, 2008; among others).

We select Spanish small and medium size companies according to the requirements established by the European Commission's recommendation 2003/361/CE of 6th May 2003, under which small and medium-sized firms are those meeting the following criteria for at least three years: fewer than 250 employees; turnover of less than €50 million; and less than €43 million in total assets. In addition, a series of filters is applied. The observations of firms with anomalies in their accounts were eliminated, for example negative values in their assets or sales, and firms whose total assets differ from total liabilities and equity. Finally, to reduce the impact of outliers, we eliminated 1% of the extreme values for all variables employed in this paper. The final sample consists of an unbalanced panel of 71,635 firm-year observations for 11,337 manufacturing companies for 2000-2007. We chose a sample of manufacturing firms due to the homogeneity across industries in credit terms.

3.2 Variables

The dependent variable to be analyzed is return on assets (ROA). This variable is defined as the ratio of Earnings Before Interest and Taxes (EBIT) to total assets (Michaelas et al. 1999; Titman and Wessels, 1988). The key independent variable is the investment in accounts receivable (REC) calculated as the ratio of accounts receivable to total assets (Boissay and Gropp, 2007; Cuñat, 2007; Deloof and Jegers, 1999).

Additionally, all regressions include control variables found by previous literature to explain firm profitability (e.g. Deloof, 2003): size of the firm (SIZE), growth opportunities (GROWTH), and its leverage

(DEBT). SIZE is the logarithm of total assets. There is no consensus about the relation between value and size of the firm. For instance, Lang and Stulz (1994) find a negative relation between firm size and performance for U.S. companies, whereas Berger and Ofek (1995) find a positive relation. So, we cannot establish a clear relation between firm size and profitability. Growth opportunities (GROWTH) are measured by sales annual growth $(Sales_t - Sales_{t-1})/Sales_{t-1}$. In this sense, Scherr and Hulburt (2001) assume that firms that have grown well so far are better prepared to continue to grow in the future, and that growing firms have better investment opportunities (Niskanen and Niskanen, 2006). Thus, we expect a positive relation between growth opportunities and firm profitability. Finally, DEBT is the ratio of debt to total assets. Previous literature points in different directions with respect to the impact of debt on firm value and profitability (Harris and Raviv, 1991; Joh, 2003). Debt may yield a disciplinary effect when free cash flow exists (Jensen, 1986; Stulz, 1990). Firms can also use debt to create tax shields (Modigliani and Miller, 1963). However, information asymmetry and agency conflicts associated with debt for smaller firms could lead creditors to demand higher returns (Pettit and Singer, 1985). So, it is not clear a priori which effect predominates. Furthermore, since good economic conditions tend to be reflected in a firm's profitability and trade credit depends on macroeconomic factors, controls were applied for the evolution of the economic cycle using the variable GDP, which measures annual GDP growth[2] (Niskanen and Niskanen, 2006). Finally, time and sectorial dummies are included in all regressions.

Table 1 offers descriptive statistics of the variables employed in this paper. The return on assets is around 6.5 percent. The economic importance of trade credit is evident. Consistent with the study of Giannetti (2003), we find that, for the average company, accounts receivable represents the largest asset category on the balance sheets; the investment in accounts receivable is over 34 percent of total assets and the number of days for accounts receivable is around 97 days. Together with this, the average firm has growth sales of 9 percent annual, and 64 percent of leverage.

Insert Table 1 Here

Table 2 shows the correlation matrix for the variables defined above. There is a significant positive correlation between the return on assets and accounts receivable to assets (0.1595). This shows that the supply of trade credit is associated with an increase in firms' profitability. As regards control variables, SIZE is positively related to ROA, although the correlation is very small (0.0099). There is a significant positive correlation between GROWTH and ROA (0.2071), while DEBT is negatively correlated with ROA (-0.2226). With regard to the correlations between independent variables, there are no high values between them which could lead to multicolineality problems.

Insert Table 2 Here

[2] GDP growth rate was extracted from Eurostat.

Table 3 reports return on assets and accounts receivable by sector of activity. Ng et al. (1999) find that trade credit practice is likely to show a wide variation across industries in credit terms, but little variation within industries. Thus, we split the sample according to NACE (Rev. 2) [3] two digits code (10-33), giving a total of 24 industries. Manufacture of beverages is the industry with the lowest investment in receivables with a value of 23.97 percent, followed by Manufacture of food products, and Manufacture of furniture with an investment in receivables of 29 percent. This result is not surprising, as these industries rely heavily on cash sales. In contrast, firms that fall into the category of Manufacture of electrical equipment, Manufacture of computer, electronic and optical products, and Repair and installation of machinery and equipment have the highest ratio of receivables over assets, with an average ratio of 39.5 percent. We find that differences in the means are statistically significant (ANOVA test).

Insert Table 3 Here

3.3 Methodology

We start from Ordinary Least Squares (OLS) as our initial method of estimating. Then, we introduce a fixed effect estimation (FE) to control for the presence of individual heterogeneity. Fixed effects estimation[4] assumes firm-specific intercepts which capture the effects of those variables that are particular to each firm and that are constant over time. However, corporate finance literature has pointed out the potential endogeneity problems in financial decisions[5]. We therefore perform the Hausman (1978) test to compare the estimation's coefficients made by instrumental variables (we employ the first lag of the independent variable as instrument) and by ordinary least squares, under the null hypothesis of exogeneity of the explanatory variables. As we reject the null hypotheses, we also estimate using instrumental variables. Our results are consistent for all estimators used.

4. RESULTS

4.1 Trade Credit-Profitability Relationship

First, in order to have a preliminary idea of the relation between firm profitability and the investment in receivables, figure 1 represent the mean values of ROA variable for each decile of the variable REC. We observe greater profitability for firms with more trade credit investment. This suggests a linear and positive relation between trade credit and profitability, as we can see that higher investment in trade credit is related to better profitability.

[3] NACE is the European classification of economic activities. NACE is a classification derived from ISIC (International Standard Industrial Classification) to enable international comparability.

[4] We perform the Hausman (1978) test; if the null hypothesis is rejected, only within-group estimation is consistent; if accepted, random-effects estimation is the best option, since not only is it consistent, it is also more efficient than the within-group estimator.

[5] The investment in trade credit may be influenced by the firm´s profitability and the positive relationship between trade credit and return on assets could be explained if more profitable firms grant more trade credit to their customers because of their greater financial capacity.

Insert Figure 1 Here

However, the results of this analysis are not sufficient to describe the relation between trade credit and firm profitability, since control variables have not been taken into account, so we conducted further analyses. Specifically, in table 4 (columns 1, 3 and 5) we regress trade credit (REC) on profitability (ROA) including SIZE, GROWTH, DEBT and GDP as control variables.

According to expectations, our results confirm Hypothesis 1 of a positive relationship between the investment in trade credit and SMEs profitability[6]. The supply of trade credit is beneficial despite the existence of credit management costs, as well as late payment and exposure to payment default. Although the results are not presented, this positive relationship is maintained when we regress trade credit (REC) on profitability (ROA) and control variables for each of the 24 industries established in Table 3 and for the three methods of estimation. These results are consistent with those reported by Hill et al. (2012) for U.S. listed firms. As we discussed above, the greater information asymmetry regarding product quality and the competitive pressures that SMEs are normally subject to means that they offer trade credit to prevent loss of sales, and decrease in profitability. In addition, high-growth firms, in many cases SMEs, can employ trade credit terms as a competitive tool to continue to increase firm sales and, therefore, firm profitability.

Trade credit granted also has sector-specific levels and trends; consequently we also analyze the industry effect on our results. Several authors, such as Smith (1987), Ng et al. (1999) and Fisman and Love (2003) find that trade credit terms are uniform within industries and differ across industries. Smith (1987) argues that within an industry both parts, buyers and sellers, face similar market conditions, while across industries, market conditions and investment requirements in buyers may vary significantly. Paul and Boden (2008) suggest that firms need to match normal industry terms to maintain their market competitiveness. If the credit granted by a firm is not competitive compared to firms in the same sector, it could have negative effects on firm profitability. To take into account industry effect, we employ the variable ADJUSTEDREC, which is firm accounts receivable minus industry mean accounts receivable. We present the results in columns 2, 4 and 6 (table 4). ADJUSTEDREC is positively and significantly related to ROA. Since this variable is positive for firms with more receivables than the average firm in their industry, the results provide empirical evidence that higher investment in trade credit than industry mean increases firm profitability. In this sense Niskanen and Niskanen (2006) argue that a firm willing to grow, or one whose sales are declining, may choose a strategy of extending more trade credit than the average firm in its industry to increase its sales. This result is also consistent with Hill et al. (2012), although from a different motivation, who state that trade credit may help customers facing liquidity problems, which could facilitate future sales.

Insert Table 4 Here

[6] We also test for the existence of a non-linear relationship between trade credit and profitability including variable REC^2 in the regression. Results reject this hypothesis and confirm a linear relationship.

4.2 Trade credit motives and profitability

To test the hypothesis put forward in our paper that the relation between firm profitability and trade credit differs according to firms' characteristics, we develop the following model that relates firm profitability to trade credit, incorporating interaction between the receivables ratio and dummy variables measuring size, liquidity, sales volatility, and market share.

$$ROA_{it} = \beta_0 + (\beta_1 + \beta_2\, DUMMY_{it}) \times REC_{it} + \beta_3\, DUMMY_{it} + \beta_4\, SIZE_{it} + \beta_5\, GROWTH_{it} + \beta_6\, DEBT_{it} + \beta_7\, GDP_t + \eta_i + \lambda_t + I_s + e_{it} \quad (1)$$

We employ dummy variables to study the effect of financial, operational, and commercial motives on firm profitability. How do receivables affect firm profitability? If we solve the brackets of model 1, we obtain: $\beta_1 \times REC_{it} + \beta_2 \times REC_{it} \times DUMMY_{it}$. Therefore, in the case that $DUMMY_{it}$ takes value 1, $\beta_1 + \beta_2$ accounts for the effect on firm profitability. Otherwise, when $DUMMY_{it}$ takes value 0, interaction variable is 0, and β_1 accounts for the effect. Moreover, like Dittmar and Mahrt-Smith (2007), we include in the model the $DUMMY_{it}$ variable on its own, because if an endogenous relation exists, it is more likely to show up in the dummy variable than in the interaction with receivables. $SIZE_{it}$, $GROWTH_{it}$, $DEBT_{it}$, and GDP_t are control variables described above. η_i is the unobservable heterogeneity; λ_t control for time effects and are year dummy variables that change in time but are equal for all firms in each of the periods considered; parameter I_s controls by the industry in which the firm operates and ε_{it} is the error term.

In order to test the financial motive for trade credit we segmented the sample according to firm size, measured as DSIZE - a dummy variable that takes value one if firm SIZE of that year (logarithm of total assets) is less than or equal to the median firm size in the sample, and zero otherwise - and liquidity measured as DLIQ - a dummy variable that takes value one if firm liquid assets (cash and cash equivalents to total assets) are smaller than or equal to the median liquid assets. For SMEs, the size of the firm is a common proxy for financial constraints (Almeida et al. 2004; Faulkender and Wang, 2006) or creditworthiness (Petersen and Rajan, 1997). As stated in Hypothesis 2, we expected larger and more liquid firms to have greater profitability from receivables than smaller firms.

In columns 1, 3, and 5 of table 5 we present the results for the effect of firm size on the profitability of receivables, using ordinary least squares (OLS), fixed effects (FE) and instrumental variables estimation (IV), respectively. The REC×DSIZE negative coefficient indicates that trade credit investment is more profitable for larger firms than for smaller firms (except for fixed effect estimation). For instance, with the OLS method of estimation (column 1), the profitability of receivables for the subsample of smaller firms (DSIZE=1) is 0.0502 + (-0.011) = 0.0392, while for the subsample of larger firms (DSIZE=0) this value is 0.0502. As for instrumental variables estimation (column 5), the figures are 0.0731 for larger firms and 0.0379 for smaller firms[7]. This result is consistent with the view that unconstrained firms (larger firms) offer trade credit to finance their customer´s growth because of their greater financial capacity, so increasing

[7] The results do not change if we eliminate control variable SIZE from the estimations.

profitability. Trade credit implies accounts receivable financing, since it requires the seller to seek financing from a third party (usually a bank). An alternative accounts receivable financing is factoring. Summers and Wilson (2000) find that firms with more difficulty in raising institutional finance use more factoring. The use of factoring by small firms which are under financial pressure and credit rationed is more likely. According to the extent to which the firm uses factoring, the profitability of receivables might decrease due to the costs of subcontracting (e.g. commissions and interest costs). In short, accessing capital markets is more difficult and expensive for smaller firms, so these firms obtain less profitability from receivables than larger firms. These results support the financial motive for trade credit and are not consistent with product quality guarantee argument. Other reasons explaining this higher return could be the existence of scale economies associated to trade credit management in larger firms (fixed costs associated with the granting and monitoring process). Hence the internalization of credit management is greater, the larger the firm (Summers and Wilson, 2000). In addition to cost savings, a large customer base could help to identify buyers' financial problems, since the experience with some customers will yield information on the default risk of others (Ng et al. 1999). Larger firms have more sophisticated and efficient credit management, through increased capacity to invest in specialized personnel and procedures or information technologies (Mian and Smith, 1992; Peel et al. 2000). They are therefore better able to enforce contracts and may suffer fewer bad debts.

Insert Table 5 Here

In columns 2, 4 and 6 of Table 5 we examine the effect of the liquidity of the firm on the value of the accounts receivable, using OLS, FE and IV, respectively. Since the interaction variable (REC×DLIQ) coefficient β_2 is negative and significant, the sum of the coefficients (REC+REC×DLIQ) $\beta_1 + \beta_2$ is lower than β_1, indicating that the profitability of receivables is lower for the subsample of less liquid firms (DLIQ=1). We find that liquidity is a factor which positively affects the profitability of receivables[8]. This may be because more liquid firms are able to provide financing to their customers when they experience temporary liquidity shocks that may threaten their survival (Cuñat, 2007). Suppliers would lend to their customers in financial trouble when another source of financing is not available. Hence, trade credit can be used to mitigate customers´ financial frictions, which may facilitate future sales and reinforce a long-term relation with them. Moreover, this positive effect can be explained by the fact that the implicit return on receivables is greater than the return on alternative investment, as Petersen and Rajan (1994) and Atanasova (2007) find. Finally, trade credit terms and, therefore, the implicit interest rate charged by firms may be different depending on the firm's market position, thus explaining the differences in the profitability of trade credit. Larger and/or more liquid firms could offer worse credit terms - a shorter period of payment or fewer discounts for prompt payment - to their smaller and less liquid customers, so obtaining higher profitability from receivables. Larger and more liquid (unconstrained) firms, with their advantageous access to capital, can offer flexible credit terms to help the buyer in financial difficulties and preserve customers'

[8] Additionally, we analyze the effect of inventories on the profitability of receivables. In line with Bougheas et al. (2009) and Daripa and Nilsen (2005), we find that the profitability of receivables is higher for lower inventories firms.

value. Therefore, the results confirm Hypothesis 2 since profitability of receivables is higher for larger and liquid firms.

To test the effect of the operational motive for trade credit on firm profitability we now split the sample according to SALESVOL – the variable reflecting demand variability. Following Long et al. (1993), this is the standard deviation of sales (three years) divided by mean sales over a three-year period. DSALESVOL is a dummy variable that takes value one if SALESVOL is smaller than or equal to the median sales volatility in the sample. According to the operational motive, trade credit incentivizes customers to acquire merchandise at times of low demand (Emery, 1987). Long et al. (1993) find a direct relation between trade credit levels and demand uncertainty. Thus, we expected a greater effect of trade credit on firm profitability for the subsample of uncertain or variable product demand. Results reported in columns 1 (OLS), 3 (FE) and 5 (IV) of Table 6 for equation 1 including dummy variable DSALESVOL and the interaction REC×DSALESVOL show support for this Hypothesis (H_3). Since the interaction coefficient β_2 is negative and statistically significant, the profitability of receivables for firms with uncertain demand is higher than for firms with a stable demand. The negative effect of the variable REC×DSALESVOL on firm profitability may be a result of costs reduction for firms with uncertain demand. Hence, trade credit policy can be used to mitigate the consequences of uncertain sales (Emery, 1987), and the finding supports the operational motive for trade credit.

Insert Table 6 Here

Finally, to test the commercial motive for trade credit, we split the sample according to firm market share. We define DMKSHARE as a dummy variable that takes value one if MKSHARE is smaller than or equal to the median market share in the sample, where MKSHARE is the ratio of annual firm sales to annual industry sales. In columns 2 (OLS), 4 (FE), and 6 (IV) of Table 6, we estimate equation 1 including DMKSHARE and REC×DMKSHARE to get additional information about the effect of trade credit to stimulate sales, and consequently enhance profitability. The results indicate that for firms with greater market presence the supply of trade credit is more profitable than for firms with smaller market shares, since REC×DMKSHARE is statistically significant and negatively signed, except for the fixed effects estimation. Unlike Hill et al. (2012), we find evidence that the incentives to extend financing are higher for firms with larger market shares. There may be several reasons. On the one hand, firms with market power are not forced to grant trade credit in the same way as firms with less market presence, so these firms will evaluate credit risks and grant trade credit to their customers with higher credit quality. On the other hand, dominant suppliers are in a better position to enforce their payment terms and to enforce contracts, so they may suffer less debt defaults. Furthermore, if the firm sells a specific product that is not easily replaceable, the cost of interruption (for the buyer) in the supply of the inputs will be higher, and, therefore, the buyer is less likely to default. Finally, the above argument can be applied here; larger market share firms could offer worse credit terms to their customers than lower market power firms, so obtaining higher profitability from receivables. This argument could be related to price discrimination, since the vendor firm might charge a higher price to credit customers than to cash customers, so obtaining a higher profit margin and therefore

greater profitability. To conclude, empirical results do confirm that the profitability of receivables is positively related to firm market share and firm size, so giving more support to the financial motive.

Results in Tables 7 and 8 examine the robustness of earlier results. We find almost identical results when using different proxies to split the sample into subsamples according to firm characteristics (D2SIZE, D2LIQ, D2SALESVOL, and D2MKSHARE). Specifically, for each year, we sort firms according to their size (natural logarithm of total assets) and assign to the financially constrained (unconstrained) group those firms whose size variable is smaller (greater) than or equal to the size variable of the firm at the 25^{th} (75^{th}) percentile of the annual size variable distribution. We repeat the process with the remaining variables: LIQ, SALESVOL, and MKSHARE.

Insert Tables 7 and 8 Here

We also test an additional specification with all the dummies together but without the interactions between them and receivables, and the results do not change. We find a positive relation between receivables and profitability. Moreover, we find that smaller firms are more profitable, maybe due to greater internal flexibility. Furthermore, results show that less liquid firms and less market share firms are less profitable. Finally, firms with more stable sales could be less risky (less variability of economic returns) but less profitable business.

Regarding the results of the control variables in Tables 4 to 8, we find contradictory empirical evidence for the relation between size and profitability. Overall, we report a negative coefficient of the variable SIZE in OLS and IV estimations, and a positive one in FE estimations, but the coefficient of the variable SIZE is not always significant. Demsetz and Villalonga (2001) also reported a non-significant relation between firm size and firm performance. GROWTH is positive in all cases, so growth in sales causes profit to grow. Moreover, sales growth could be an indicator of a firm's investment opportunities, and it is an important factor in allowing firms to enjoy improved profitability. Consistent with agency costs of debt, we find a negative effect of debt on profitability[9]. Finally we do not find a significant relationship between GDP growth and ROA[10].

Summing up, we find a positive relationship between accounts receivable and firms' profitability. Moreover, there are differences in the value of receivables according to firms' characteristics. In this sense, we find higher profitability of receivables for larger and more liquid firms (that suffer less credit constraints), as well as for larger market share firms. Furthermore, uncertain demand firms have higher receivables profitability. Thus, the evidence supports the financial and operational motives for trade credit.

[9] The relation receivables-profitability does not change if we include control variables squared. Moreover, in general, the relation between ROA and control variables does not change either.

[10] However, when time dummies are excluded we find a positive association between GDP growth and firm profitability for OLS and FE estimations. When economic conditions are good, i.e. high GDP growth, firms will enjoy a higher profitability.

However, we do not find results supporting the commercial motive for trade credit, since we find lower profitability from receivables for less market presence firms and for small firms with lower reputation in product markets.

5. CONCLUSIONS

Trade credit management is particularly important in the case of small and medium-sized firms since an important part of their assets are invested in accounts receivables. Consequently, efficient trade credit management could improve firm profitability significantly. Though the impact of trade credit policy on SMEs profitability is highly important, no studies have been carried out to examine this relation. The objective of this paper is to provide empirical evidence of the effect of trade credit on the profitability for a sample of Spanish manufacturing SMEs during the period 2000-2007

We find a positive linear relationship between the investment in trade credit and firm profitability derived from the fact that the benefits associated to trade credit surpass the costs of vendor financing. Further evidence supports the financial motive for trade credit, showing that financially unconstrained firms (larger and more liquid firms) obtain extra profitability by granting trade credit than do financially constrained firms. The findings also support the operational motive for trade credit. Actually, the use of trade credit is more profitable for firms with variable demand than for firms with stable demand. In this sense, trade credit might be used to smooth demand, thus lowering operating costs and therefore enhancing firm profitability. However, we do not find evidence for the commercial motive; neither have we found that extending trade credit is more profitable for less market share firms than for firms with greater market presence, nor that smaller firms with no reputation in product markets obtain higher profitability from trade credit.

These results show the important role of trade credit as a determinant of SMEs profitability and provide valuable insights for academics and managers since the results suggest that by increasing their investment in trade credit SMEs might enhance their profitability, especially in the case of financially unconstrained firms, firms with volatile demand and larger market share firms. Moreover, higher investment in trade credit that industry mean increases firms profitability. This paper highlights the importance of current assets management in the maximization of firm value and opens an important field for future research. However this study is also relevant for other groups of stakeholders, such as financial institutions and policy makers, since financial institutions play a key role in the financing of short-term commercial trade, and policy makers, in view of the importance of trade credit for SMEs profitability, should enforce trade agreements to combat late payment in trade credit.

To finish, one possible limitation is that the study focuses on a period of economic expansion (2000-2007). From our point of view, the over-time robustness of the findings is interesting. It would be appropriate to replicate this study in a period of economic downturn, like the present, when data is available, in order to compare the results and draw conclusions. Due to liquidity and financial constraints arising from the current financial crisis, the relations obtained could be different. Late payment or non-payment in commercial

transactions has increased significantly and because of this the positive relation found between the investment in trade credit and profitability could differ. Therefore, this is an important step for future research.

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Table 1

Descriptive Statistics

Variable	*Obs*	*Mean*	*Std. Dev.*	*Perc 10*	*Median*	*Perc 90*
ROA	71635	0.0647	0.0595	0.0089	0.0547	0.1397
REC	71635	0.3424	0.1662	0.1319	0.3290	0.5714
SIZE	71635	7.0826	1.0863	5.6699	7.0493	8.5832
GROWTH	71635	0.0882	0.2162	-0.1308	0.0629	0.3250
DEBT	71635	0.6402	0.1919	0.3652	0.6633	0.8781
GDP	71635	0.0405	0.0031	0.0330	0.0410	0.0430

Table 2
Correlation Matrix

	ROA	***REC***	***SIZE***	***GROWTH***	***DEBT***	***GDP***
ROA	1					
	0.0000					
REC	0.1595	1				
	0.0000	0.0000				
SIZE	0.0099	0.0635	1			
	0.0081	0.000	0.0000			
GROWTH	0.2071	0.0973	0.0237	1		
	0.0000	0.0000	0.0000	0.0000		
DEBT	-0.2226	0.0018	-0.117	0.1631	1	
	0.0000	0.6229	0.0000	0.0000	0.0000	
GDP	0.0060	-0.0005	-0.0775	-0.019	0.0357	1
	0.1056	0.8994	0.0000	0.0000	0.0000	0.0000

Table 3

Accounts receivable and ROA by industry

	Obs	*ROA*	*REC*
1 Manufacture of food products	7189	0.0539	0.2908
2 Manufacture of beverages	1349	0.0456	0.2397
3 Manufacture of tobacco products	0		
4 Manufacture of textiles	3145	0.0518	0.3199
5 Manufacture of wearing apparel	1605	0.0591	0.3041
6 Manufacture of leather and related products	1702	0.0578	0.3548
7 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	4529	0.0601	0.3361
8 Manufacture of paper and paper products	1479	0.0549	0.3453
9 Printing and reproduction of recorded media	5052	0.0577	0.3291
10 Manufacture of coke and refined petroleum products	23	0.0960	0.3663
11 Manufacture of chemicals and chemical products	2907	0.0715	0.3667
12 Manufacture of basic pharmaceutical products and pharmaceutical preparations	136	0.0721	0.3077
13 Manufacture of rubber and plastic products	3880	0.0631	0.3517
14 Manufacture of other non-metallic mineral products	6400	0.0680	0.3558
15 Manufacture of basic metals	1358	0.0712	0.3742
16 Manufacture of fabricated metal products, except machinery and equipment	14791	0.0724	0.3701
17 Manufacture of computer, electronic and optical products	898	0.0780	0.3998
18 Manufacture of electrical equipment	1713	0.0745	0.4035
19 Manufacture of machinery and equipment n.e.c.	5211	0.0694	0.3564
20 Manufacture of motor vehicles, trailers and semi-trailers	1085	0.0753	0.3238
21 Manufacture of other transport equipment	275	0.0720	0.3415
22 Manufacture of furniture	3788	0.0625	0.2904
23 Other manufacturing	1462	0.0665	0.3334
24 Repair and installation of machinery and equipment	1658	0.0749	0.3866
ANOVA		0.0000	0.0000

ANOVA is p-value of ANOVA test. It provides a statistical test of whether or not the means of several groups are all equal. If the null hypothesis is rejected, there are significant differences between groups. ROA and REC variables are defined in section 3.2.

Table 4
Effect of trade credit on profitability

	(1) OLS	(2) OLS	(3) FE	(4) FE	(5) IV	(6) IV
REC	0.0445***		0.0555***		0.0556***	
	(35.30)		(27.28)		(34.44)	
ADJUSTEDREC		0.0445***		0.0553***		0.0555***
		(35.26)		(27.13)		(34.37)
SIZE	-0.0009***	-0.0009***	0.0183***	0.0184***	-0.0007***	-0.0007***
	(-4.75)	(-4.73)	(21.14)	(21.19)	(-3.45)	(-3.44)
GROWTH	0.0638***	0.0639***	0.0498***	0.0498***	0.0672***	0.0672***
	(66.07)	(66.1)	(60.43)	(60.51)	(62.47)	(62.53)
DEBT	-0.0836***	-0.0836***	-0.1851***	-0.1851***	-0.0818***	-0.0818***
	(-76.72)	(-76.71)	(-67.96)	(-67.97)	(-70.22)	(-70.22)
GDP	-0.0987	-0.2931	-0.2041	-0.4472	-6.3398	-6.2163
	(-0.07)	(-0.20)	(-0.17)	(-0.37)	(-0.62)	(-0.61)
Constant	0.1146*	0.1357**	0.0629	0.0917*	0.3718	0.3828
	(1.85)	(2.18)	(1.23)	(1.80)	(0.85)	(0.87)
R-squared	0.1563	0.1562	0.0874	0.0847	0.1536	0.1535
$Hausman_1$			0.00	0.00		
$Hausman_2$					0.00	0.00
Observations	71635	71635	71635	71635	60298	60298

Variables are defined in section 3.2 and 4.1. Time and sectorial dummies are included in all regressions, although coefficients are not presented.
t statistics in brackets. ***significant at 1%, **significant at 5%, *significant at 10% level.
Hausman is p-value of Hausman (1978) test. $Hausman_1$ compares within-group and random-effects estimators. $Hausman_2$ compares the estimations for instrumental variables and OLS.

Table 5
Firm characteristics and profitability of receivables (I)

	(1) OLS	(2) OLS	(3) FE	(4) FE	(5) IV	(6) IV
REC	0.0502***	0.0493***	0.0566***	0.0654***	0.0731***	0.0672***
	(27.68)	(26.98)	(20.47)	(26.52)	(28.49)	(24.93)
REC×DSIZE	-0.0110***		-0.0019		-0.0352***	
	(-4.45)		(-0.57)		(-11.22)	
DSIZE	0.0001		-0.0014		0.0089***	
	(0.09)		(-0.94)		(6.72)	
REC×DLIQ		-0.0068***		-0.0093***		-0.0244***
		(-2.79)		(-3.68)		(-7.66)
DLIQ		-0.0126***		-0.0071***		-0.0063***
		(-13.45)		(-7.16)		(-5.34)
SIZE	-0.0023***	0.0001	0.0176***	0.0183***	-0.0019***	0.0004*
	(-6.99)	(0.61)	(19.15)	(21.21)	(-5.47)	(1.70)
GROWTH	0.0638***	0.0622***	0.0498***	0.0487***	0.0672***	0.0658***
	(66.09)	(64.85)	(60.42)	(59.34)	(62.51)	(61.66)
DEBT	-0.0838***	-0.0735***	-0.1851***	-0.1795***	-0.0827***	-0.0717***
	(-76.77)	(-65.69)	(-67.95)	(-65.91)	(-70.74)	(-59.94)
GDP	-0.0962	-0.0241	-0.1924	-0.2573	-5.5482	-7.6420
	(-0.07)	(-0.02)	(-0.16)	(-0.21)	(-0.54)	(-0.76)
Constant	0.1243**	0.1046*	0.0680	0.0633	0.3425	0.4181
	(2.00)	(1.70)	(1.33)	(1.25)	(0.78)	(0.96)
R-squared	0.1568	0.1707	0.0875	0.0971	0.1531	0.1674
$Hausman_1$			0.00	0.00		
$Hausman_2$					0.00	0.00
Observations	71635	71635	71635	71635	60298	60298

Variables are defined in section 3.2 and 4.2. Time and sectorial dummies are included in all regressions, although coefficients are not presented.
t statistics in brackets. ***significant at 1%, **significant at 5%, *significant at 10% level.
Hausman is p-value of Hausman (1978) test. $Hausman_1$ compares within-group and random-effects estimators. $Hausman_2$ compares the estimations for instrumental variables and OLS.

Table 6
Firm characteristics and profitability of receivables (II)

	(1) OLS	(2) OLS	(3) FE	(4) FE	(5) IV	(6) IV
REC	0.0502***	0.0403***	0.0578***	0.0529***	0.0697***	0.0631***
	(29.47)	(22.31)	(-25.73)	(19.52)	(28.56)	(24.01)
REC×DSALESVOL	-0.0133***		-0.0091***		-0.0331***	
	(-5.42)		(-3.99)		(-10.79)	
DSALESVOL	-0.0076***		-0.0046***		-0.0006	
	(-8.10)		(-5.27)		(-0.56)	
REC×DMKSHARE		-0.0050**		-0.0010		-0.0284***
		(-2.03)		(-0.29)		(-8.90)
DMKSHARE		-0.0164***		-0.0169***		-0.0064***
		(-15.49)		(-11.57)		(-4.82)
SIZE	-0.0008***	-0.0072***	0.0175***	0.0148***	-0.0006***	-0.0063***
	(-4.31)	(-24.47)	(-20.17)	(16.78)	(-3.06)	(-20.00)
GROWTH	0.0623***	0.0626***	0.0512***	0.0480***	0.0658***	0.0659***
	(64.84)	(65.15)	(-62.15)	(58.10)	(61.47)	(61.50)
DEBT	-0.0885***	-0.0836***	-0.1863***	-0.1822***	-0.0865***	-0.0823***
	(-80.71)	(-76.94)	(-68.62)	(-66.99)	(-73.86)	(-70.82)
GDP	-0.2089	-0.2993	-0.2318	-0.2547	-7.0612	-7.1043
	(-0.14)	(-0.20)	(-0.19)	(-0.21)	(-0.70)	(-0.70)
Constant	0.1273**	0.1751***	0.0739	0.0965*	0.4062	0.4478
	(2.06)	(2.83)	(1.45)	(1.90)	(0.93)	(1.03)
R-squared	0.1665	0.1657	0.0952	0.0885	0.1634	0.1615
$Hausman_1$			0.00	0.00		
$Hausman_2$					0.00	0.00
Observations	71635	71635	71635	71635	60298	60298

Variables are defined in section 3.2 and 4.2. Time and sectorial dummies are included in all regressions, although coefficients are not presented.
t statistics in brackets. ***significant at 1%, **significant at 5%, *significant at 10% level.
Hausman is p-value of Hausman (1978) test. $Hausman_1$ compares within-group and random-effects estimators. $Hausman_2$ compares the estimations for instrumental variables and OLS.

Table 7
Firm characteristics and profitability of receivables. Robustness (I)

	(1) OLS	(2) OLS	(3) FE	(4) FE	(5) IV	(6) IV
REC	0.0604***	0.0596***	0.0538***	0.0775***	0.0880***	0.0839***
	(22.71)	(21.18)	(10.88)	(17.33)	(23.53)	(19.97)
REC×D2SIZE	-0.0210***		-0.0012		-0.0500***	
	(-5.89)		(-0.20)		(-11.00)	
D2SIZE	-0.0065***		0.0345***		0.0044*	
	(-2.88)		(3.83)		(1.71)	
REC×D2LIQ		-0.0178***		-0.0221***		-0.0419***
		(-4.85)		(-4.14)		(-8.60)
D2LIQ		-0.0182***		-0.0128***		-0.0101***
		(-13.15)		(-6.03)		(-5.71)
SIZE	-0.0057***	0.0000	0.0213***	0.0168***	-0.0052***	0.0003
	(-8.90)	(-0.01)	(14.00)	(11.96)	(-7.54)	(1.04)
GROWTH	0.0637***	0.0616***	0.0518***	0.0473***	0.0660***	0.0667***
	(46.38)	(44.09)	(43.22)	(36.55)	(42.86)	(42.84)
DEBT	-0.0840***	-0.0725***	-0.1998***	-0.1657***	-0.0833***	-0.0704***
	(-54.19)	(-44.39)	(-47.42)	(-38.01)	(-50.12)	(-40.19)
GDP	1.2044	1.2820	1.3791	1.8042	-2.0972	-2.1752
	(0.70)	(0.62)	(1.01)	(1.04)	(-0.19)	(-0.16)
Constant	0.0963	0.0537	-0.0336	-0.0213	0.2179	0.1852
	(1.34)	(0.62)	(-0.57)	(-0.29)	(0.45)	(0.32)
R-squared	0.1563	0.2025	0.0873	0.1274	0.1520	0.2007
$Hausman_1$			0.00	0.00		
$Hausman_2$					0.00	0.00
Observations	35819	35822	35819	35822	29969	30210

Variables are defined in section 3.2 and 4.2. Time and sectorial dummies are included in all regressions, although coefficients are not presented.
t statistics in brackets. ***significant at 1%, **significant at 5%, *significant at 10% level.
Hausman is p-value of Hausman (1978) test. $Hausman_1$ compares within-group and random-effects estimators. $Hausman_2$ compares the estimations for instrumental variables and OLS.

Table 8
Firm characteristics and profitability of receivables. Robustness (II)

	(1) OLS	(2) OLS	(3) FE	(4) FE	(5) IV	(6) IV
REC	0.0590***	0.0458***	0.0677***	0.0537***	0.0816***	0.0700***
	(24.54)	(17.38)	(19.36)	(11.95)	(23.19)	(17.75)
REC×D2SALESVOL	-0.0224***		-0.0153***		-0.0464***	
	(-6.39)		(-3.70)		(-10.39)	
D2SALESVOL	-0.0107***		-0.0086***		-0.0025	
	(-8.00)		(-5.30)		(-1.52)	
REC×D2MKSHARE		-0.0126***		-0.0046		-0.0387***
		(-3.47)		(-0.76)		(-8.15)
D2MKSHARE		-0.0251***		-0.1732***		-0.0135***
		(-13.22)		(-5.10)		(-5.76)
SIZE	-0.0011***	-0.0080***	0.0184***	0.0146***	-0.0009***	-0.0072***
	(-4.01)	(-18.22)	(14.56)	(10.93)	(-2.79)	(-15.03)
GROWTH	0.0538***	0.0618***	0.0439***	0.0503***	0.0575***	0.0646***
	(42.38)	(45.40)	(38.22)	(41.48)	(39.64)	(42.21)
DEBT	-0.0896***	-0.0852***	-0.2031***	-0.1851***	-0.0879***	-0.0836***
	(-56.19)	(-55.26)	(-47.59)	(-46.29)	(-50.96)	(-50.51)
GDP	0.6030	0.2891	-0.6876	0.2362	27.2413*	-8.6947
	(0.35)	(0.20)	(-0.45)	(0.18)	(1.74)	(-0.81)
Constant	0.0963	0.1636***	0.0991	0.1564***	-1.0673	0.5278
	(1.33)	(2.64)	(1.52)	(2.75)	(-1.59)	(1.14)
R-squared	0.1686	0.1711	0.0858	0.0412	0.1660	0.1654
$Hausman_1$			0.00	0.00		
$Hausman_2$					0.00	0.00
Observations	35818	35816	35818	35816	29248	30004

Variables are defined in section 3.2 and 4.2. Time and sectorial dummies are included in all regressions, although coefficients are not presented.
t statistics in brackets. ***significant at 1%, **significant at 5%, *significant at 10% level.
Hausman is p-value of Hausman (1978) test. $Hausman_1$ compares within-group and random-effects estimators. $Hausman_2$ compares the estimations for instrumental variables and OLS.

LIST OF FIGURES

Figure 1: Mean value of ROA for each decile of REC