

TOURISM SECTOR AND TRADE CREDIT: A QUANTILE REGRESSION APPROACH IN SMEs

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ABSTRACT

This paper analyses the determinants of the trade credit in Spanish tourist SMEs from a new perspective. More specifically, we focus on the relationship between trade credit and other important financial resources: bank credit and self-financing, and a quantile regression approach is used to analyse trade credit in the tourism sector. This methodology takes into account the heterogeneity of firms in different quantiles of trade credit distribution. Our results show that smaller, younger and less self-financed firms use more trade credit to compensate their financing problems.

Key words: trade credit; bank credit; SME; tourism sector; quantile regression.

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Abstract

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I. INTRODUCTION

The tourism sector is one of the most important in the Spanish economy. This is due, on the one hand, to its higher contribution to the formation of the GDP, reaching between 10% and 11% in the period 2008-2012 according to the National Institute of Statistics. On the other hand, it is also among those sectors with a larger number of companies, approximately 283,000 in 2013, small and medium-sized enterprises (SMEs) in their great majority. This type of company is the most vulnerable to obtaining financing, which accentuates their dependence on bank financing and trade credit (Berger and Udell, 1998). Therefore, the previous literature, has analysed the determinants of trade credit and has particularly focused on the relationship between trade credit and two other essential financial resources: bank credit and self-financing.

Firstly, with regard to the relationship between trade credit and bank credit, there are two alternative hypotheses that help to explain this important question: the substitution hypothesis and the complementary hypothesis. The substitution hypothesis holds that that firms tend to employ trade credit to a greater degree when credit from financial institutions is constricted, and suppliers may agree to lend due to their customers closeness (Petersen and Rajan, 1997). Thereby, this hypothesis predicts a negative relation between the two resources (Atanasova and Wilson 2003, Carbó-Valverde *et al.* 2012, Kestens 2012).

The complementary hypothesis holds that the level of trade credit is positively related to the level of lending by banks. Therefore, the two resources move in the same direction, a decline/rise in bank credit is followed by a decrease/increase in trade credit usage, thereby amplifying the impact on small businesses of any financial contraction or expansion (Cook 1999, Ono 2001, Uesugi and Yamashiro 2008). In this case, the use of trade credit acts as a signal and reveals supplier's information to the banks that cannot always assess the financial quality of a firm when this one appears informationally opaque to them (Biais and Gollier, 1997).

Secondly, the relationship between trade credit and internal financing has been explained by the Pecking Order Theory. This theory posits that firms generating more internal funds use less financing from suppliers (Niskanen and Niskanen, 2006, Garcia-Teruel and Martínez-Solano, 2010a,b). However, it also possible that companies that generate more internal resources enjoy better access to financing from their suppliers (Petersen and Rajan, 1997).

All in all, the explanation of the relationships between trade credit and bank credit and self-financing is not conclusive due to the mixed results of the above empirical evidence. Following Berger and Udell (1998) research, it is necessary to consider the interconnection of small firm resources according to the financial growth cycle paradigm. In this paradigm, the capital structure of the company varies with firm size and age, and the relation between the financial resources may also vary. However, previous evidence has considered firms samples as homogeneous, which could explain the diversity of results in the financial literature. The question is whether these relationships can be considered homogeneous for all firms or vary depending on their size and age characteristics.

Bearing the above idea in mind, this article pretends to study about the true nature of the relationships of trade credit with bank credit and with self-financing, using the methodology already employed by Canto-Cuevas *et al.* (2016c). Specifically, we use the quantile regression approach, which takes into account the heterogeneity of SMEs in different quantiles of trade credit distribution. According to the financial growth cycle paradigm, the level of trade credit can be taken as a proxy for the age and size of the firm. The smallest and youngest firms are forced to rely more on trade credit: first, due to their lack of available information and to their greater opacity, which leads them to credit rationing (Stiglitz and Weiss, 1981); and second, due to being subjected to greater limitations in the self-generation of resources.

In order to extend the line of study started in the tourism sector with Canto-Cuevas *et al.* (2016a), the empirical analysis uses a sample of Spanish SMEs belonging to this

relevant sector, which is characterized by the scarcity of studies in trade credit. Furthermore, due to this sector is one of the most affected by the economic situation (González-Romo, 2011), we chose the period is 2004-2011, which is distinguished by years of economic growth and depth crisis.

The remainder of the article is organized as follows. Section 2 describes the data and constructs the empirical framework. Section 3 presents results. Section 4 concludes.

II. DATA AND MODEL

The sample used was obtained from the SABI (Sistema de Análisis de Balances Ibéricos) database. Specifically, the sample contains Spanish tourists SMEs, whose parameters are within the European Commission definition for every year under consideration: number of employees between 10 and 250, sales between 2 and 50 million of euros, and total assets ranging from 2 to 43 million euros. Finally, the sample give an unbalanced panel of 986 observations over the period 2004-2011.

Our estimation method is the quantile regression estimator developed by Koenker and Basset (1978). Unlike the standard regression estimator, which only provides a partial view of the relationship between the dependent variable and the set of regressors, quantile regression facilitates the study of the complexity of the interactions between the factors that determine the data with unequal variation of a variable for different ranges of another variable. This methodology has been used previously in the context of SMEs trade credit by Canto-Cuevas et al. (2016c). The following equation specifies our function:

$$\text{Quant}_{\theta}(y_{it}|x_{it}) = \alpha_0 + \beta_{\theta} x_{it} + \gamma z_t$$

Where y_{it} is the dependent variable at quantile θ (*TRADECREDIT*), defined as the ratio of accounts payable to total assets¹. The vector x_{it} includes the determinants of trade credit. Firstly, we introduce the independent variables related to financial resources considered. Bank credit is defined by two variables: *STDEBT* which is short-term bank debt to total assets; and *LTDEBT*, which is long-term bank debt to total assets. *NETPROF* is the proxy of self-financing and is measured as net profit over total assets.

Secondly, classic determinants of trade credit are also considered as control variables. Size (*SIZE*) and age (*AGE*) are calculated as the logarithm of the total assets and the logarithm of years of life of the company, respectively. Current assets (*CURRAS*) is the current assets to total assets of the company. Lastly, due to the influence of economic situation over trade credit (Schwartz 1974), we introduce the average annual growth rate in GDP (*GDPGROWTH*) which is obtained from World Bank.

Table 1 presents the means of the firm characteristics at different quantiles of trade credit distributions and for the whole sample. This preliminary analysis shows that younger and smaller firms, which usually present more asymmetric information problems and generally experience greater difficulties in obtaining finance from financial institutions, use trade credit more, and therefore, that the level of trade credit can be effectively taken as a proxy of age and size of firms.

¹ The dependent and independent variables are defined according to previous empirical literature on trade credit.

Table 1 Descriptive Statistics

Variables	<10% Mean	10-25% Mean	25-50% Mean	50-75% Mean	75-90% Mean	>90% Mean	Overall Mean
TRADECREDIT	0.004	0.019	0.023	0.046	0.090	0.214	0.054
STDEBT	0.048	0.053	0.053	0.058	0.057	0.060	0.055
LTDEBT	0.284	0.249	0.244	0.249	0.220	0.233	0.247
NETPROF	0.029	0.023	0.025	0.031	0.055	0.018	0.030
SIZE	9.775	9.661	9.628	9.473	9.066	8.896	9.460
AGE	3.324	3.149	3.091	3.121	3.211	2.899	3.144
CURRAS	0.170	0.191	0.202	0.185	0.274	0.352	0.216

III. EMPIRICAL RESULTS

Table 2 presents OLS regression (column 1) and the results of quantile regression (columns 2-6). Specifically, we define five quantiles, namely Q10, Q25, Q50, Q75, and Q90.

Table 2 Regression results for trade credit

Variables	OLS	Q10	Q25	Q50	Q75	Q90
STDEBT	0.025 (0.025)	0.002 (0.016)	0.014 (0.017)	-0.007 (0.026)	0.042 (0.059)	0.025 (0.059)
LTDEBT	-0.010 (-0.010)	-0.006 ** (0.004)	-0.003 (0.005)	-0.009 (0.008)	-0.012 (0.018)	0.003 (0.019)
NETPROF	-0.138 *** (-0.138)	-0.011 (0.017)	-0.018 (0.017)	-0.023 (0.017)	-0.097 ** (0.044)	-0.173 ** (0.069)
SIZE	-0.041 *** (-0.041)	-0.011 *** (0.001)	-0.015 *** (0.002)	-0.027 *** (0.002)	-0.035 *** (0.003)	-0.043 *** (0.008)
AGE	-0.027 *** (-0.027)	-0.008 *** (0.001)	-0.008 *** (0.001)	-0.014 *** (0.003)	-0.019 *** (0.007)	-0.035 *** (0.011)
CURRAS	0.109 *** (0.109)	0.020 *** (0.007)	0.030 *** (0.004)	0.044 *** (0.010)	0.085 *** (0.019)	0.272 *** (0.067)
GDPGROWTH	0.007 *** (0.007)	0.002 *** (0.001)	0.003 *** (0.001)	0.004 *** (0.001)	0.006 *** (0.001)	0.007 *** (0.001)
Constant	0.498 *** (0.498)	0.136 *** (0.017)	0.180 *** (0.021)	0.328 *** (0.029)	0.428 *** (0.042)	0.567 *** (0.075)
<i>Pseudo-R</i> ²		0.099	0.129	0.167	0.214	0.286
<i>R</i> ²	0.366					

Notes: Bootstrapped standard errors in parentheses except for the OLS equation where figures in parentheses are robust standard errors. The number of observations is 986 for OLS and all quantile regressions. *, **, and ***, indicate significant at the 10, 5, and 1% level, respectively

Regarding bank credit, short-term debt (*STDEBT*) suggest a complementarity relation with trade credit due to the positive coefficients showed in the majority of quantiles, while the majority of negative coefficients of long-term debt (*LTDEBT*) suggests the opposite, a substitutive relation with trade credit. However, the absence of significance of these coefficients does not confirm the results about the relation between trade credit and bank credit. Self-financing (*NETPROF*) has a negative influence on trade credit, with more significance in all the sample and the highest quantiles. This evidence that SMEs experiencing more limitations in generating self-financing, use more supplier financing.

Control variables are significant in explaining trade credit. While the sign of the coefficients remains unchanged across the quantiles, their magnitude is greater in the highest quantiles. *SIZE* and *AGE* show a negative coefficient, evidencing that bigger and older firms use less trade credit, while the positive coefficients of *CURRAS* evidences that firms use trade credit to finance their current assets. The positive coefficient of *GDPGROWTH* confirms the cyclical effect of the economic situation in all the quantiles of trade credit, which increases in the period of economic boom, and contract during a period of crisis (Canto-Cuevas *et al.* 2016b).

IV. CONCLUSION

This research is focused on the determinants of the trade credit on Spanish tourist SMEs, and specifically on the relationships between trade credit and two other financial resources: bank credit and self-financing, using a quantile regression approach.

Our results show that the use of trade credit is negative related with the size and age of a firm, evidencing the growth cycle paradigm. In addition, the relationship of trade credit with self-financing is substitutive for the tourism sector, therefore, firms less self-financed use more trade credit.

It is note of worthy that the results obtained for the tourism sector, unlike other works, show that short-term bank credit and trade credit move in the same direction, suggesting a complementary relationship. While the results of trade credit with long-term bank credit, which has more weight in the financial resources, suggests a substitutive relation that let firms to employ trade credit to a greater degree when credit from financial institutions is constricted.

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