Capital Structure Determinants During the Sovereign Debt Crisis Period in Europe

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Abstract

This study investigates the speed of adjustment of the capital structure of small and medium capitalised firms in Europe before and during the sovereign debt crisis period. The sample includes 306 firms from 10 European countries comprising 2,142 firm-year observations for the period 2006 to 2013. After controlling the influence of firm-level, industry-level, and macroeconomic factors on debt levels, we report that small and medium capitalised firms have adjusted their capital structure during the sovereign debt crisis period and the speed of adjustment was quicker in non-stressed countries compared to the firms in the stressed countries. Our findings also show that the quality of countries' institutional factors has significantly influenced the speed of adjustment of leverage of small and medium capitalised firms during the crisis period. Our findings suggest that the firm-level determinants of leverage for small and medium capitalised firms in Europe are; size and asset tangibility. Furthermore, the industry-level determinant is industry median leverage and macroeconomic-level determinants are GDP growth rate and inflation rate. The policy implications of the findings indicate that improving the country's institutional environment (such as governance, rule of law, and corruption) will ease small and medium capitalised firms' financial difficulties, which in turn facilitate their economic performance and resilience.

Keywords: Leverage, small and medium capitalised firms, capital structure, sovereign debt crisis, stressed country, non-stressed country

JEL Classification: G20, G32

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Introduction

A growing body of research has identified the importance of capital structure decisions on firm value and risk management. Therefore, the focus of the majority of prior researchers has mainly been on determinants of the capital structure decisions of firms. The empirical evidence from large firms indicates that not only firm characteristics are important (see Benkraiem & Gurau, 2013; Hall, Hutchinson & Michaelas, 2004; Harris & Raviv, 1991), but the industry-level and country-level determinants also influence capital structure decisions. Gungoraydinoglu and Öztekin (2011) and Kayo and Kimura (2011) even go further to quantify the proportional effect firm, industry, and macroeconomic level variables have on capital structure decisions. They report that 36% of the variation in capital structure is explained by the time period; 2% by industry-level characteristics; 3% by country-level factors; and the remaining 7% by combined country and industry effects. Öztekin (2015) shows that the quality of countries' institutional factors affects leverage decisions and significantly influences the speed of adjustment toward target leverage as well. Since Lane (2012) states that an increase in the cost of borrowing leads to the tightening of the credit standards during the crisis period; investors/managers become reluctant to buy corporate bonds or firms' equity. For small and medium capitalised firms (hereafter SMCFs), the economic downturn would make it harder to get credit and, consequently, lead to a decline in earnings. Therefore, the effect crisis has on SMCFs tends to be much more severe compared to large firms (Wehinger, 2014). However, it is not clear from prior research whether the capital structure of SMCFs' is also influenced by the firm-level, industry-level, and macroeconomic characteristics, similar to the large firms. If so, the effect capital structure decisions of SMCFs have on firm value and risk remains unclear as well. Therefore, the motivation of this study is to contribute to the knowledge by investigating the firm-level, industry-level, and country-level factors that influence the capital structure decisions of SMCFs in Europe. Second, we investigate whether the firm-level, industry-level, and country-level determinants of capital remain consistent during the crisis period. In this regard, we check the reliability of the factors that influence the capital structure of SMCFs before, and during the sovereign debt crisis period. Third, we investigate the effect the capital structure of SMCFs has on the firm value and risk.

Our study contributes to the literature as follows: Most of the results regarding the determinants of a capital structure relate to large listed firms, and scant research exists on whether those results also apply to the SMCFs. Although the evidence from prior studies relating to large firms indicates that firm-level, industry-level, and country-level factors play an important role in determining a firm's choice of capital structure; it is not clear whether these factors also influence SMCFs' managerial decisions. Furthermore, to what extent do these factors influence SMCFs managers' decisions during the crisis period? An increase in the cost of borrowing and tightening of the credit standards during the crisis period makes it difficult for investors/managers to buy corporate bonds or invest in firms' equity (Lane, 2012). In this regard, we examine how the sovereign debt crisis has affected the decisions of SMCFs' managers, especially relating to their choice of capital structure. The changes in the macroeconomic and microeconomic conditions would have had a severe effect on SMCFs as well. In this regard, we investigate the extent to which the changes in the macroeconomic and microeconomic conditions during the sovereign debt crisis period have forced SMCFs managers to reconsider the level of debt and equity in their capital structure. We are interested in finding out the extent to which changes in the macro-and-micro economic environment have had on the level of leverage and the speed of adjustment toward the target leverage. In this regard, the sovereign debt crisis provides an interesting event study to examine the effect the owners/managers' decisions have had on the determinants of capital structure choices of

SMCFs in Europe. Lastly, we investigate the effect capital structure decisions have on the firm value and risk of SMCFs.

Our results suggest that the SMEs in the stressed countries were affected more compared to the SMEs in the non-stressed countries. The debt ratios (MV1 and DCA) of SMEs in the stressed countries increased during the crisis period, suggesting SMEs have had to sell tangible assets to pay off long-term debt as the long-term debt (MV2) ratio declined during the crisis period. With declining profitability, increased cost of borrowing, and deteriorating institutional conditions (governance, rule of law, and corruption), SMEs have relied on internal sources of funds during the crisis period.

The rest of the study is organised as below. Section 2 provides a brief review of the literature relating to capital structure theories, capital structure during the crisis, and determinants of capital structure. Section 3 provides details of data, variables used, measurement of variables, and the research method employed. Section 4, presents the results and discussion. Section 5 presents the conclusion and recommendations of this study.

2 Literature Review

Researchers investigating the determinants of capital structure have proposed a number of alternative theories in support of the relevance of capital structure when the capital market is imperfect. The focus of this literature review is to examine the determinants of capital structure decisions of SMCFs during the crisis period. In this regard, a few researchers have investigated the effect the Asian Financial Crisis (AFC) of 1997 had on firms' capital structure in Australia, Malaysia, Singapore, and Thailand. For example, Deesomsak, Paudyal, and Pescetto (2004) reported that leverage ratios rose significantly after the 1997 Asian Financial Crisis (AFC), but the trend reversed in 2000. Kim, Heshmati, and Aoun (2006) investigated the leverage behaviour of the Korean listed firms and reported that the crisis did have an impact on the optimal capital structure. Ariff, Taufiq, and Shamsher (2008) examined the capital structure factors and speed of adjustment to target debt ratios for the firms from Korea, Indonesia, Malaysia, and Thailand for the period 1986-2001. They reported that financially distressed firms had substantially greater levels of debt than non-financially distressed firms. Their results show that the debt levels before 1997 of distressed firms were 0.167 and that of healthy firms was 0.108. The debt ratio after the AFC was between 0.627 and 0.74 for distressed firms, while the ratio for non-distressed firms was between 0.35 and 0.423. In terms of the nature of the debt, more short-term debt occurred in distressed firms (a proportion of 0.509 to 0.669) compared to 0.30 for the non-distressed firms. Deesomsak, Paudyal, and Pescetto (2009) revisited the topic of the capital structure during the 1997 AFC and focused on the debt maturity structure and the speed of adjustment, of four countries during the pre-and post-crisis periods. Using the Generalized Method of Moments (GMM) regression method, they reported that firms in countries that were least affected by the Asian crisis had slower rates of capital structure adjustment, while firms in countries that were most affected by the crisis did not change their speed of adjustment.

Similar results to that found for the 1997 AFC are also reported for the Global Financial Crisis (GFC) that started in 2007. Alves and Francisco (2013) reported firms relied mainly on short-term borrowing during the debt crisis because they faced greater exposure to rollover risk with lower credit ratings and higher yield spreads. The effect of the crisis on leverage was stronger for firms in the US and developed and highly financially liberalised countries than for firms in Europe. According to Alves and Francisco (2013), this effect varied among European

countries, with a greater effect on peripheral countries, such as Greece and Italy. The heterogeneous effect is explained by Neri, Ropele, and d'Italia (2013) and Dailami (2010). They suggest that sovereign tensions caused an increase in the cost of new loans, especially long-term issuance and the retrenchment in credit, which were particularly strong in countries that were most affected by the crisis.

Frank and Goyal (2009) considered firm, industry, and country-level factors to determine the capital structure of US firms. They reported that growth, tangible assets, profitability, size, industry median leverage, and expected inflation have significant impacts on the capital structure decisions of firms. Antoniou, Guney, and Paudyal (2008) reported that asset tangibility and the size of firms had a positive impact on the leverage ratio, while profitability, growth opportunities, and share price performance had an inverse effect. In addition, the market conditions in which firms operated also affected the selection of the capital structure. Benkraiem and Gurau (2013) examined five factors including size, profitability, growth, tangibility, and volatility for French firms. The result for size showed that French medium firms had more debt than small ones. Firm profitability had a negative relationship with the total debt ratio, while growth had a positive relationship with the total debt ratio. The tangibility of assets was inversely related to leverage and volatility did not significantly influence capital structure.

SMCFs find it more difficult to get access to external financing resources including equity funding from investors (Hall et al., 2004). In this regard, most of the prior researchers have reported that firm size has a negative relationship with the firm's debt ratio (Antoniou et al., 2008; Benkraiem & Gurau, 2013; Hall et al., 2004).

Furthermore, some researchers have investigated the growing firms' need for funds. For example, when internal sources are insufficient, firms are required to raise funds from external sources. In this regard, prior research indicates that there is a positive relationship between growth and leverage ratio (Cosh & Hughes, 1994; Michaelas, Chittenden, & Poutziouris, 1999). However, empirical evidence relating to a firm's growth and leverage are contradictory. For example, De Veirman and Levin (2012) investigated a sample of Japanese firms and reported that firms that reduced their debt levels the most in the period 1991-1997 did not grow more quickly compared to firms in the recovery years 2003-2005. In addition, access to finance did not become systematically more difficult for weak firms, indicating that the difficulty of access to finance might have resulted from other factors such as macroeconomic or institutional factors rather than a firm's growth rate. This negative relationship is also reported by Antoniou et al. (2008) and Frank and Goyal (2009). According to Drobetz and Fix (2003), highly volatile firms take on less debt than those with low volatility.

De Jong, Kabir, and Nguyen (2008) investigated the importance of country-specific drivers of capital structure and reported that country-level determinants had both direct and indirect impacts on capital structure decisions across 42 countries. Factors such as bond market development, credit rights protection, and GDP growth rate had significant direct effects on firms' capital structure. The statistically significant positive relationship between GDP and debt level suggests that firms in countries with a high growth rate tend to use high debt capital (ie leverage) to finance new investments. The indirect impact of macroeconomic factors, such as legal enforcement, capital information, and GDP growth rate also influence firm-specific determinants of capital structure. Bokpin (2009) examined the effect of macroeconomic elements on the selection of capital structure of emerging firms. Firms from 34 developing countries for the period 1990 to 2006 were included in the research. The country-specific

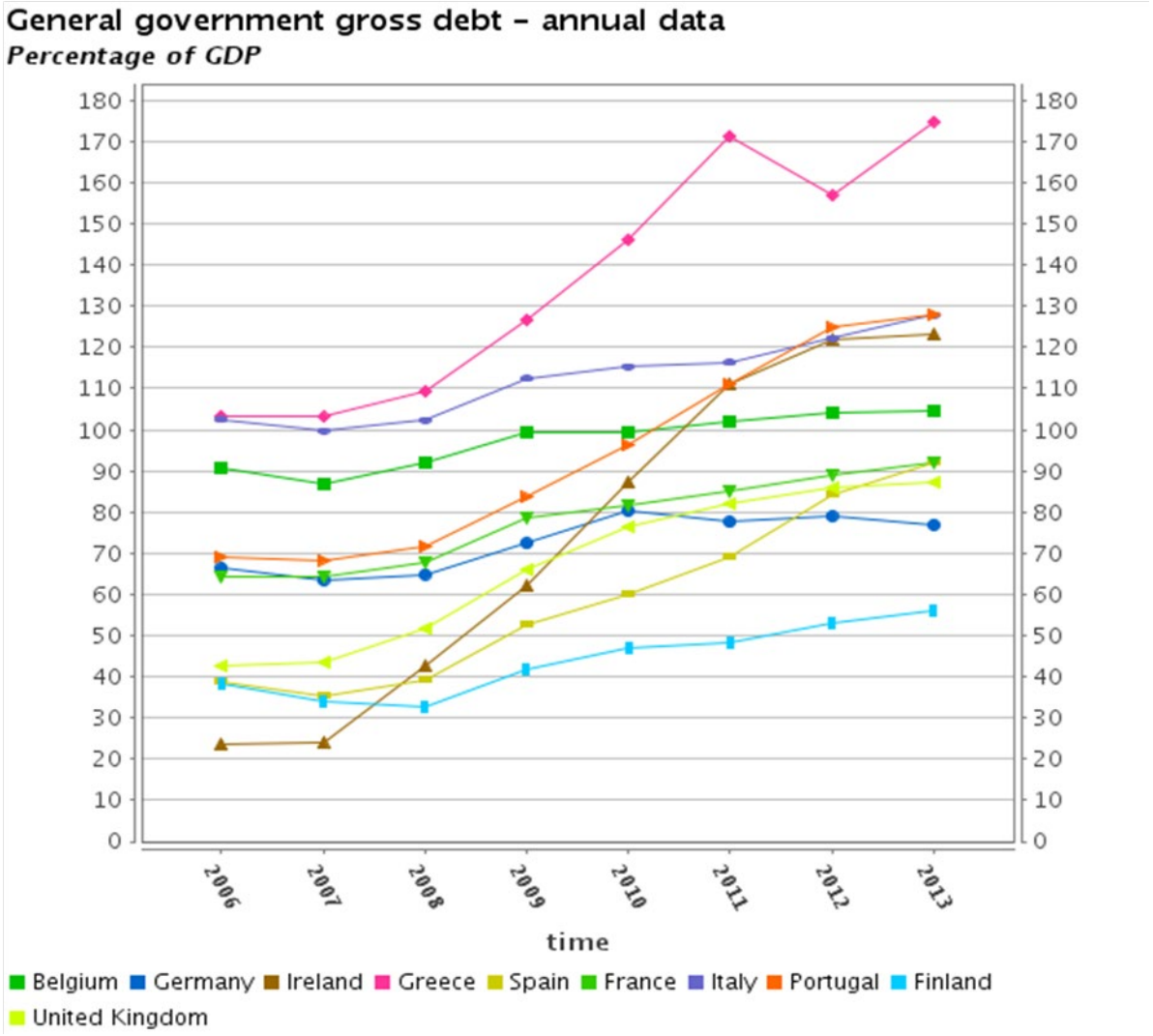
drivers of the capital structure included inflation, gross domestic product (GDP) per capita, central bank discount rate, bank size, and market size measured by the ratio of market capitalisation to GDP. Among the factors investigated, both GDP per capita and inflation had a significant negative impact on firms' capital structure decisions. Higher inflation and improvement in the economy encouraged firms to use internal resources, lowering their leverage ratios. On the contrary, bank credit had a statistically significant positive relationship with the capital structure mix of firms. Similar to Bokpin (2009), Alves and Francisco (2013) reported a negative relationship between the debt ratio and GDP growth rate. A reasonable explanation for this was that a high GDP growth rate implied a higher dividend or free cash flow that increased a firm's equity value, which caused the book debt ratio to fall. In terms of the government's general gross debt, it had a positive influence on the long-term debt ratio and had a reverse effect on the short-term debt ratio. Alves and Francisco (2013) documented that the recent increase in the government's gross debt was in line with the high level of market leverage and book leverage. Alves and Francisco noted that firms appeared to follow the irrational exuberance of debt and, therefore, a deleveraging process should occur over the following years. Frank and Goyal (2003) argue that only 30% of capital structures are explained by firm-specific determinants.

3 Data and Research Method

3.1 Data

The sovereign debt crisis started in the spring of 2010, which disrupted financial markets and economic activities. To investigate the effect of the sovereign debt crisis on the capital structure of SMCFs in Europe, data was collected for the period 2006 to 2013. To investigate the effect of the sovereign debt crisis on firms, the sample period was subdivided into the before-crisis period 2006-2009; and during the crisis period 2010-2013. The partitioning of data into two sub-periods allows for identifying: (i) whether there was a change in the capital structure; and (ii) whether there was a change in the factors influencing capital structure decisions before and during the crisis. Data were collected from 10 countries: Belgium, Finland, France, Germany, Greece, Ireland, Italy, Portugal, Spain, and the UK. Since the countries in our sample have different institutional and regulatory environments, it allows us to investigate the impact it has on capital structure decisions. To investigate the impact the sovereign debt crisis has had on different debt levels of countries, the sample was further divided into non-stressed economies (UK, France, Germany, Belgium, and Finland) and stressed economies. In 2010, the stressed countries (Portugal, Spain, Greece, Italy, and Ireland) announced the need for possible bailouts (Young & Semmler, 2011), and in 2013; four out of 10 countries had government debt levels higher than 100% of GDP (see Figure 1 below). According to Figure 1, at the end of 2013, the stressed countries, except Spain, have government debt levels of more than 100% of GDP. Greece has the most critical sovereign debt level, although the level dropped in 2012. On the other hand, Finland is the country with the lowest government debt to GDP.

Figure 1: Government debt to GDP (percentage)



The data for the small and medium-size firm's characteristics were collected from the Thomson One database. To investigate the firm size effect on the capital structure decisions, we have divided the sample into small firms and medium firms based on the total assets. If the total assets of the firm are below the median total asset value, the firm was classified as small, otherwise medium.

The macroeconomic data were collected as follows: the general gross government debt from the Euro statistics website. The growth in GDP and the inflation data from the World Bank database. Data regarding stock market capitalisation to GDP was collected from the World Bank website (http://data.worldbank.org/indicator/CM.MKT.LCAP.GD.ZS), bond market capitalisation to GDP data was collected from CESifo Group Munich (https://www.cesifo-group.de/...Markets/...Markets/...Markets...bond-market), and corporate tax rates from the Trading Economics (http://www.tradingeconomics.com/euro-area/corporate-tax-rate).

As the financial and utility firms have different regulatory rules, our sample includes only non-financial and nonutility small and medium capitalised firms. In order to minimise the impact of outliers, the data was winsorized at the 1st and 99th percentile. The final sample includes 2,142 firm-year observations for 306 firms.

Prior researchers have indicated that the institutional environment of a country has the potential to influence firms' financing decisions (see Bae & Goyal, 2009; Fan Titman, & Twite, 2012; Gungoraydinoglu & Öztekin, 2011; Kayo & Kimura, 2011; Öztekin, 2015). Furthermore, countries that have well-developed debtholder (equity holder) protection rights may have cheaper debt (equity) financing, resulting in higher (lower) leverage levels. In this regard, institutional factors have the potential to influence the long-term capital structure of firms in a country. To investigate the effect of institutional factors on the small and medium capitalised firms' capital structure decisions, data for the institutional factors (rule of law (ROL), regulation (REGULA) government effectiveness (GOVEFF), Corruption (CORRUPT), voice, and accountability (VnACC), and political stability (POLSTAB))[4] was collected from the Transparency International website (https://www.transparency.org/country) for the period 2006-2013.

Rule of Law (ROL) captures the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Higher levels of rule of law indicate that a country has stronger creditor protection; that is, creditors can force repayment, repossess the collateral and gain control of the firm, which would lead to higher levels of debt. Regulatory quality (REGULA) captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. We use regulatory quality to account for governance, and contracting mechanisms to mitigate conflict between managers, shareholders, and debtholders. According to La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998), capital markets function well when there are good securities regulations and enforcement to reduce the cost of external financing. We also use government effectiveness (GOVEFF) to capture the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. According to Acemoglu and Johnson (2005), government effectiveness reflects on the quality of contracting institutions and poor quality of institutions reflects lower levels of debt (La Porta et al. 1997; 1998; Levine, 1999). We use control of corruption (CORRUPT) to capture the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. At lower levels of corruption, firms are likely to use external sources of funds; that is, higher debt levels (Durnev, Errunza & Molchanov, 2009). We use voice and accountability (VnACC) to capture the extent to which a country's citizens are able to participate in selecting their government, developed financial markets, and availability of external sources of finance. Therefore, higher levels of VnACC will lead to the use of more debt. We also use political stability and the absence of violence/terrorism (POLSTAB) as an indicator for the level of political instability and/or politically motivated violence, including terrorism. We assume that higher levels of POLSTAB will lead to business development and optimism, and therefore use more debt to finance growth and expansion as well as freedom of expression, freedom of association, and free media.

Although Myers (1984) suggests that book values are better proxies for the value of assets, others argue that the market value reflects more accurately the intrinsic value of the assets (Flannery & Rangan, 2006; Frank & Goyal, 2009). Based on the study undertaken by Deesomsak et al. (2004) and Frank and Goyal (2009), we have used only the market value of debt ratios in this study. The market value of total assets is calculated by the sum of total liabilities and the market

[4] The values for the institutional factors range between -2.5 to 2.5, where higher values represent favourable and lower values represent unfavourable factors.

value of common equity, which equals market capitalization (the price per share multiplied by the number of common shares outstanding). Following Booth et al. (2001), De Jong et al. (2008), and Hall et al. (2004), we have used the market value of the long-term debt ratio to do a robustness check, which is measured by the long-term debt divided by the market value of total assets. Welch (2012) states that "debt-to-capital active" (DCA) is a good measurement for leverage changes because it takes out the effect of corporate performance on leverage changes and eliminates stock-market-induced noise relating to the biases arising from regularities of stock-market returns. DCA is calculated using a similar method proposed by Welch (2012):

$$DCA_{t-1,t} = \frac{D_t}{D_t + E_t} - \frac{D_{t-1}}{D_{t-1} + E_{t+1} * (1 + x_{t-1,t})}$$

where D is debt, E is Equity, and x is the capital gain of equity over the year. DCA is the net effect of all managerial debt and equity issuing and repurchasing activity, including dividends and coupon payments, during the year. DCA has the potential to eliminate stock market-induced noise as well as biases arising from stock market return regularities (such as a book-to-market effect). We have also used DCA as the dependent variable to further check the robustness of the results of our regression.

Table 2 reports the details regarding the variables, measurement method, and the expected sign for each variable used in this study.

Table 2: Measurement of Variables

Dependent Variables	Expected Sign	Measurement
Market Value of Total Debt (MV1)		Total Debt/Total Market Value of Assets
Market Value of Long-Term Debt (MV2)		Total Long-Term Debt/Total Market Value of Assets
Debt-to-Capital Active (DCA)		$DCA_{t-1,t} = D_t/(D_t + E_t) - D_{t-1}/[D_{t-1} + E_{t-1} * (1 + x_{t-1,t})]$
Independent Variables		
Profitability (PROFIT)	_	EBIT/Total Assets
Firm Size (SIZE)	+	Ln(Total Assets)
Asset Tangibility (TANG)	+	Total Fixed Assets/Total Assets
Firm's Growth (GROW)	-	(Total Liabilities + Total market Capitalization)/Total Assets
Earnings Volatility (VOL)	-	Percentage change in Net Income

Industry Median Leverage (IND_MED)	+	Median of industry leverage according to the Industry Classification Code
GDP Growth (GDP_GROW)	+	Percentage change in GDP
Government Debt (GOV_DEBT)	+	Gross Government Debt/GDP
Inflation (INFLA)	-	Percentage change in CPI
TAX	-	Corporate tax rate in each country
S_GDP	+	Stock Market Capitalization to GDP
B_GDP	+	Bond Market capitalization to GDP

3.2 Model specification

First, trend analysis is used to identify whether there is a change in the capital structure during the crisis period. Second, Fixed Effects Ordinary Least Squares (OLS) regression is used[5] to analyse the data as Flannery and Rangan (2006) state that the plain vanilla OLS regression fails to recognise the different characteristics of multiple data panels. Therefore, a panel regression with unobserved effects is more suitable for firms, which have stable and unobserved variables affecting their debt ratio. Moreover, Alves and Francisco (2013) state that the fixed effects OLS help to bypass potential problems of endogeneity. Therefore, the first regression model for this study is as follows:

$$D_{ij,t} = \alpha + \lambda D_{ij,t-1} + \sum \beta_j X_{ij,t-1} + \sum \gamma_k Z_{k,t-1} + \varphi_t Y_t + \delta_j C_j + u_{ij,t} \qquad (1)$$

where
$D_{ij,t}$ represents either the market value of leverage (MV1) or the market value of long-term debt (MV2) of firm i in country j in year t. $D_{ij,t-1}$ indicates one period-lagged variable. $X_{ij,t-1}$ is the one-period lagged firm-level variables, such as asset tangibility, profitability, firm size, firm growth, volatility of earnings, tax, and industry median leverage. $Z_{k,t-1}$ represents one period lagged kth macroeconomic variables, such as GDP growth rate, government debt level, and inflation. C_j is country fixed effects, Y_t is the year fixed effects, and u_{it} indicates the error term.

Similar to Flannaery and Rangan (2006) and Ariff, Taufiq, and Shamsher (2008), we have used lagged one period of debt ratio to capture the speed of adjustment of the capital structure towards its target ratio. Since λ is the adjustment parameter, the speed of adjustment is calculated by one minus the adjustment λ, that is, (1-λ). If firms have target (optimal) debt levels and managers make efforts to reach them, then $\lambda \neq 0$. Since there are market frictions, we expect adjustments will not be instantaneous; therefore, $\lambda \neq 1$. Based on dynamic trade-off

[5] We ran the regression for the fixed effects and random effects model and Hausman test results suggest fixed effects provide better results.

theory, λ is expected to be between 0 and 1. However, based on the pecking order, static trade-off, and market timing theories, we expect λ to be close to 0.

To control the induced noise and biases arising from the financial market (debt and stock), we have used debt-to-capital (DCA) as the dependent variable. Equation (2)

$$DCA_{ij,t} = \alpha + \lambda DCA_{ij,t-1} + \sum \beta_j D.X_{ijt-1} + \sum \gamma_k D.Z_{kt} + \varphi_t Y_t + \delta_j C_j + u_{ijt} \qquad (2)$$

where

DCA_{ij-1} indicates one period-lagged variable. $D.X_{ij,t-1}$ is the difference between the ith firm-level variables, that $is,\ D.X_{ij,t-1} = X_{ij,t} - X_{ij,t-1}$. $D.Z_{jk}$ is the difference between the kth macroeconomic variables, that is, $D.Z_{jkt} = Z_{jk} - Z_{jkt-1}$. C is country fixed effects, Y is the year fixed effects, and u_{ijt} indicates the error term.

To check the reliability of the model, Blundell and Bond's two-step system generalised method of moments (GMM) estimation is undertaken that allows to control for the endogeneity effect by using lags of endogenous variables as instruments.

4 Results

4.1 Descriptive Statistics and trend analysis

Table 3 reports the descriptive statistics for the dependent and independent variables for the full sample, pre-crisis period, during-crisis period, non-stressed countries, and stressed countries. Results in Table 3 show that the mean of the market value of debt ratio and market value of total long-term debt for stressed countries is 0.322 and 0.146, respectively. A comparison of the two sub-periods (before and during the crisis) shows that the average market value of debt (MV1) and the average debt-to-capital (DCA) are higher for the period 2010-2013 than for the 2006-2009 period. On the contrary, the mean market value of long-term debt (MV2) for the period 2010-2013 is 0.073, which is smaller than for the pre-crisis period. These results indicate that during the crisis period SMEs repaid a portion of their long-term debt, thereby leading to a decline in the value or quantity of long-term debt used. The standard deviations of the dependent variables in most cases are higher for the period 2010-2013 and the group of stressed countries compared to the pre-crisis period and the group of non-stressed countries. The results reported above for the dependent variables (MV1, MV2, and DCA) suggest that small and medium capitalised firms have adjusted their capital structure during the crisis period.

With regard to firms' characteristics, the median of profitability (PROFIT) is positive in all cases. Overall, the median profit figures are significantly low across the groups, with the highest median profitability of 2.6% belonging to the stressed group of countries. However, the means of profitability are all negative, reflecting the poor business performance of small and medium capitalised firms during the sample period, with the worst losses experienced during the crisis period (2010-2013).

Firm size fell during the crisis period from an average of 3.985 in 2006-2009 to 3.864 in 2010-2013. The average size of firms in stressed countries is larger than in non-stressed countries. The asset tangibility has a similar pattern to the firm size. Both the mean and median of the tangibility are higher during the debt-crisis period, and for the stressed countries compared to the pre-crisis period and the non-stressed countries. This result suggests that small and medium capitalised firms sold their fixed assets either to repay debt and/or finance operations and projects. Regarding the growth rate, the pre-crisis period has a lower average rate than the post-

crisis period. While the mean ratio of the period 2006-2009 is 2.64%, the corresponding figure for the period 2010-2013 is about 1.5 times that of 2006-2009. When comparing two groups of countries, the non-stressed countries present a higher mean growth value of 3.9% compared to only 1.6% for the group of stressed countries. The results for volatility show a consistently negative value in all the groups. The highest earnings fluctuation is evident in stressed countries. The average tax rate in the sampled countries is 28.4%. However, the average tax rate in non-stressed countries is 29.3% compared to 24.9% in stressed countries.

Some notable observations were made in relation to the determinants of capital structure at the industry and country levels. The mean of the industry median leverage declined from 0.131 before the sovereign debt crisis to 0.105 after the crisis. The stressed countries recorded a higher average industry median leverage of 0.169 compared to 0.1058 for the non-stressed countries. GDP growth rate remained constant at 0.4% during 2006-2009 and 2010-2013. However, the stressed countries had a negative mean GDP growth rate of 1.6%, which implies that the GDP of this group of countries declined during the crisis period. The mean value of government debt increased significantly during periods and between countries. The mean government debt increased from 0.65 for the pre-crisis period to 0.934 for the crisis period. While the group of non-stressed countries had an average sovereign debt ratio of about 0.69, the stressed countries had a significantly higher ratio of 1.180. In addition, the stressed countries had the largest standard deviation for government debt. The mean inflation rate was slightly lower in the pre-crisis period and for the stressed countries. In summary, macroeconomic conditions were more favourable for non-stressed countries than for stressed countries. The results for S_GDP and B_GDP suggest that stock market activities are higher during the pre-crisis period and for the non-stress countries, while bond market activities are higher during the crisis period and for the stress countries. This result suggests that firms borrow more during the crisis period and equity finance during the periods when stock market activities are high.

The correlation coefficient for variables reported in Table 4 shows only dependent variables (MV1, MV2) having high correlations. However, it is not a concern as MV1 and MV2 are not used in the same regression. The correlations for the independent variables are low, thus suggesting that multicollinearity is not a major concern for this study. The variance inflation factor (VIF) results reported in the last column in Table 4 suggest multicollinearity is not a problem.

Figure 2 depicts the comparative book value and the market value of debt. The book value is consistently higher than the market value. Figure 3 depicts the change in the average market debt ratio between non-stressed countries and stressed countries for the sampling period. The market debt ratio is consistently higher for stressed countries than for non-stressed countries. In the stressed countries, leverage increased during the period 2006-2012. The highest percentage change in debt ratio (38%) occurs in 2011, and it decreases from 37% in 2012 to 32% in 2013. Figure 3 shows that the average debt ratio in non-stressed countries starts to fall from 14% in 2009 to 13% in 2010. During the 2011 to 2013 period, the market debt ratio records a constant low percentage of 10%. Hence, during the crisis, the two groups of countries have different trends for market debt ratio. While the stressed countries appear to have increased their debt levels, the non-stressed countries have either lowered or kept their market debt level unchanged.

Table 3: Summary Statistics

Category	Criteria	MV1	MV2	DCA	PROFIT	SIZE	TANG	GROW	VOL	IND_MED	GDP_GROW	GOV_DEBT	INFLA	Tax	S_GDP	B_GDP
2006-2013	Mean	0.152	0.076	0.360	-0.030	3.925	0.183	0.034	-1.756	0.118	0.004	0.792	0.025	0.284	4.263	3.086
	Median	0.084	0.017	0.025	0.014	3.874	0.059	0.013	-0.166	0.114	0.017	0.764	0.023	0.280	4.420	2.761
	Std Dev	0.180	0.121	17.986	0.216	1.269	0.275	0.365	41.318	0.086	0.030	0.298	0.012	0.045	0.657	0.592
NoCrisis 2006-2009	Mean	0.149	0.078	0.112	-0.029	3.985	0.167	0.026	-1.554	0.131	0.004	0.650	0.023	0.298	4.368	3.058
	Median	0.086	0.020	0.003	0.015	3.929	0.058	0.014	-0.146	0.146	0.013	0.642	0.023	0.300	4.335	2.768
	Std Dev	0.171	0.122	9.832	0.214	1.316	0.237	0.162	40.201	0.081	0.032	0.234	0.011	0.043	0.530	0.574
Crisis 2010-2013	Mean	0.155	0.073	0.598	-0.032	3.864	0.200	0.042	-1.959	0.105	0.004	0.934	0.026	0.269	4.157	3.114
	Median	0.082	0.011	0.110	0.013	3.817	0.061	0.012	-0.197	0.095	0.017	0.819	0.026	0.260	4.718	2.711
	Std Dev	0.188	0.120	23.462	0.219	1.216	0.308	0.490	42.420	0.088	0.028	0.289	0.013	0.044	0.610	0.610
Diff (Mean)		**-0.006****	0.005	**-0.494****	0.003	**0.121****	**-0.033****	-0.016	-0.405	**0.026*****	0.000	**-0.284*****	**-0.003****	**0.029*****	**-0.211*****	**-0.056****
Non-stress countries	Mean	0.108	0.057	0.148	-0.040	3.782	0.131	0.039	-1.189	0.105	0.009	0.691	0.025	0.293	4.226	3.065
	Median	0.051	0.006	0.062	0.011	3.737	0.036	0.014	-0.162	0.092	0.017	0.764	0.023	0.300	4.333	2.761
	Std Dev	0.138	0.103	20.071	0.234	1.268	0.231	0.408	36.641	0.082	0.023	0.160	0.010	0.039	0.669	0.604
Stress countries	Mean	0.322	0.146	0.412	-0.036	4.474	0.138	0.016	-3.947	0.169	-0.016	1.180	0.023	0.249	4.405	3.169
	Median	0.319	0.095	0.878	0.026	4.390	0.278	0.008	-0.180	0.177	-0.019	1.125	0.029	0.250	4.776	3.159
	Std Dev	0.216	0.155	30.831	0.120	1.114	0.334	0.063	55.793	0.082	0.043	0.381	0.018	0.051	0.591	0.540
Diff (Mean)		**-0.021*****	**-0.089*****	**-0.264****	0.004	**-0.692****	-0.007	0.023	**2.758*****	**0.064*****	**0.025*****	**-0.042****	**0.008*****	**0.004**†	**-0.178*****	**-0.015*****

† significance at 10%, ** significance at 5% and * significance at 1%**

Table 4: Correlation Matrix

	MV1	MV2	DCA	PROFIT	SIZE	GROW	TANG	VO	IND_ MED	GDP_ GROW	GOV_ DEBT	INFLA	TAX	S_GDP	B_GDP	VIF
MV1	-															
MV2	0.7480 (0.000)	-														
DCA	0.007 (0.918)	-0.012 (0.890)	-													
PROFIT	0.099 (0.000)	0.088 (0.000)	0.003 (0.895)	-												**1.08**
SIZE	0.148 (0.000)	0.141 (0.000)	0.046 (0.0240	0.185 (0.000)	-											**1.09**
GROW	0.001 (0.804)	0.030 (0.879)	-0.001 (0.980)	-0.021 (0.297)	0.003 (0.983)	-										**1.00**
TANG	0.421 (0.000)	0.361 (0.000)	0.085 (0.000)	-0.003 (0.889)	0.095 (0.000)	-0.040 (0.048)	-									**1.23**
VOL	-0.044 (0.032)	-0.014 (0.777)	-0.003 (0.881)	0.045 (0.028)	-0.005 (0.820)	0.003 (0.886)	-0.045 (0.025)	-								**1.01**
IND_MED	0.364 (0.000)	0.265 (0.003)	0.019 (0.357)	0.161 (0.000)	0.035 (0.083)	-0.024 (0.239)	0.220 (0.000)	-0.008 (0.699)	-							**1.14**
GDP_GROW	-0.309 (0.000)	-0.171 (0.037)	-0.051 (0.004)	0.020 (0.218)	0.023 (0.251)	0.028 (0.164)	-0.215 (0.000)	0.035 (0.080	-0.180 (0.000)	-						**1.59**
GOV_DEBT	0.442 (0.000)	0.246 (0.027)	0.059 (0.004)	0.067 (0.001)	0.096 (0.000)	-0.013 (0.503)	0.375 (0.000)	-0.031 (0.129)	0.153 (0.000)	-0.501 (0.000)	-					**2.28**
INFLA_	-0.058 (0.004)	-0.046 (0.023)	0.006 (0.786)	-0.043 (0.021)	-0.093 (0.000)	-0.004 (0.855)	-0.005 (0.817)	-0.031 (0.125)	-0.079 (0.000)	0.216 (0.000)	-0.140 (0.000)	-				**1.43**
TAX	-0.130 (0.000)	-0.078 (0.000)	-0.025 (0.218)	0.058 (0.004)	0.072 (0.000)	-0.018 (0.379)	-0.169 (0.000)	0.002 (0.919)	0.028 (0.174)	0.278 (0.000)	-0.305 (0.000)	-0.222 (0.000)	-			**1.38**
S_GDP	-0.445 (0.000)	-0.306 (0.000)	-0.048 (0.018)	-0.069 (0.000)	-0.136 (0.000)	0.032 (0.118)	-0.302 (0.000)	0.031 (0.131)	-0.249 (0.000)	0.508 (0.000)	-0.674 (0.000)	0.222 (0.000)	0.103 (0.000)	-		**2.61**
B_GDP	0131 (0.000)	0.111 (0.000)	-0.002 (0.941)	0.081 (0.000)	0.193 (0.000)	-0.017 (0.408)	0.049 (0.016)	-0.019 (0.329)	0.143 (0.000)	-0.202 (0.000)	0.174 (0.000)	-0.506 (0.000)	0.282 (0.000)	-0.464 (0.000)	-	**1.86**

Figure 2: Comparison of the ratio of the book value and market value to total debt (2006 – 2013)

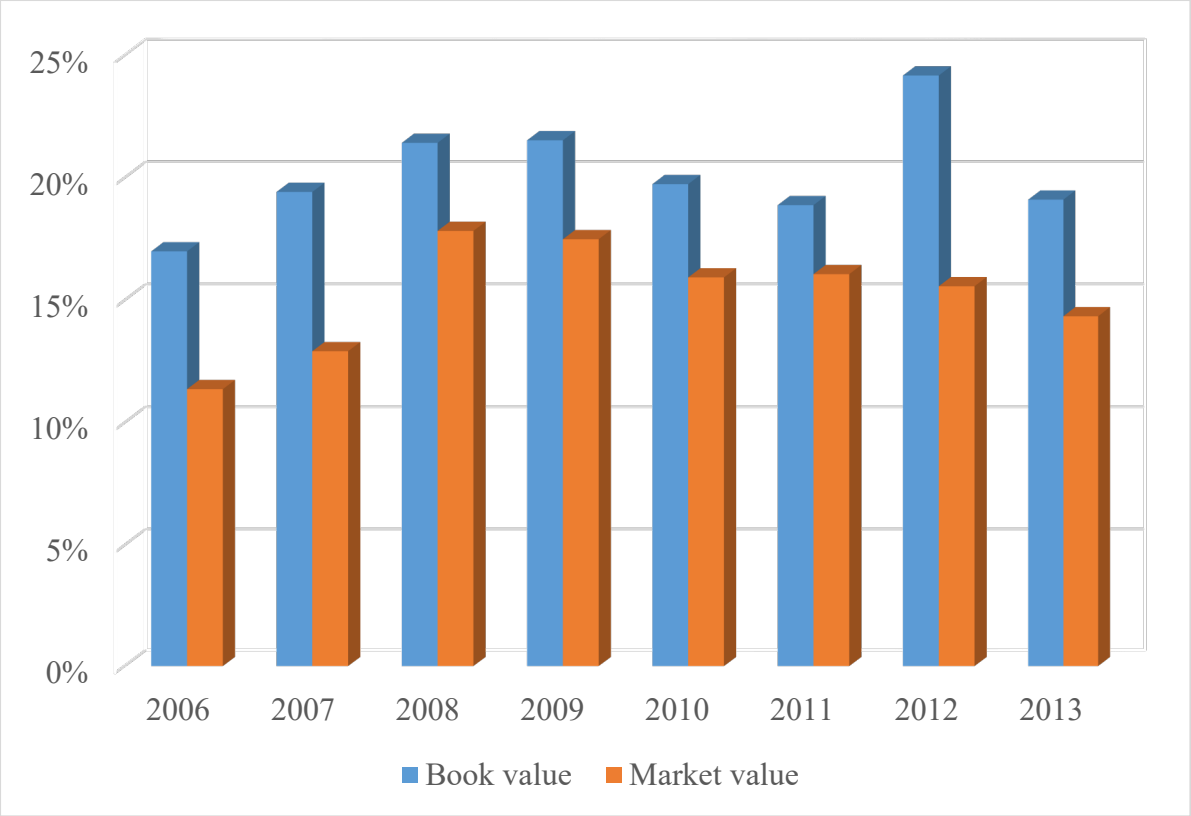
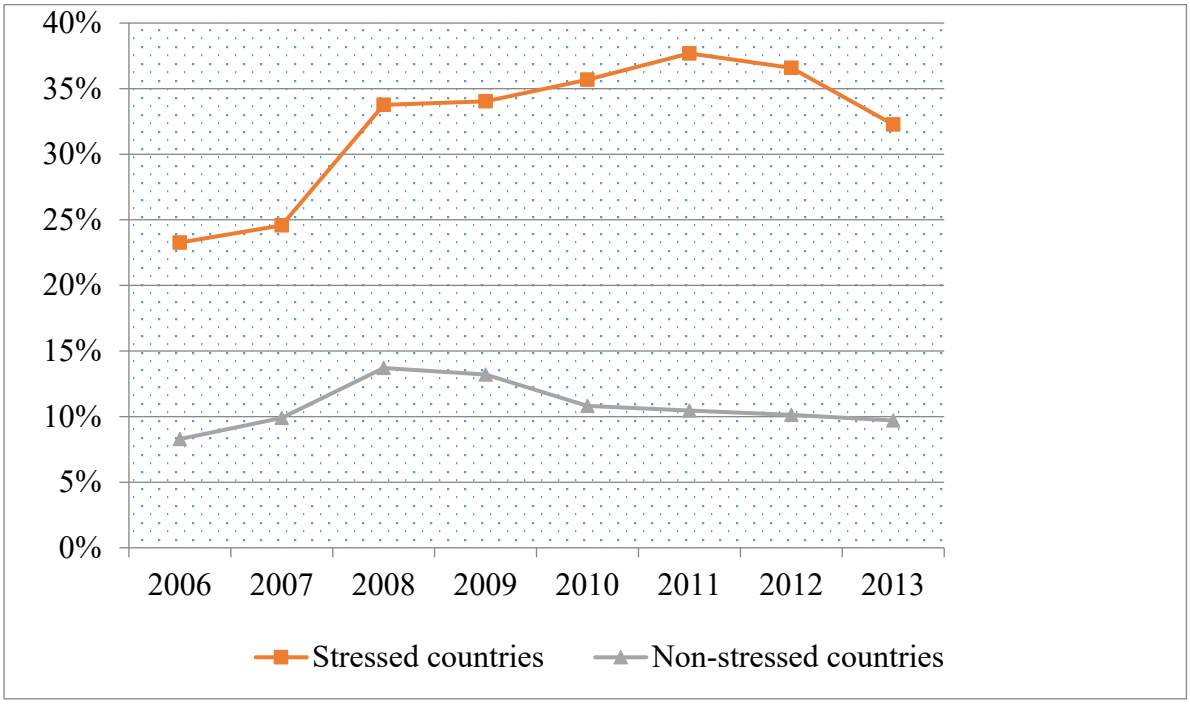


Figure 3: Market value of debt of two sub-groups of countries (2006 – 2013)



4.2 Regression Results

Table 5, columns (2) to (6), reports the Fixed Effects regression results for the market value of total debt (MV1) as the dependent variable. The results reported in columns (2) to (6) show that the lagged leverage ratio (L1.MV1) has a statistically significant positive impact on capital structure decisions. The coefficient of L1.MV1 in column 2 is 0.449 which indicates that SMCFs in Europe have a speed of adjustment of approximately 0.55 (1-0.449). Hence, it takes SMCFs approximately two years to close the gap between a typical firm's current and desired leverage ratios. Asset Size (SIZE) and asset tangibility (TANG) show statistically significant positive relationships with debt ratio at the 10%, 5%, and 10% levels, respectively. The industry median leverage has an important impact on the choice of capital structure. In columns (2) to (6), the coefficient of industry median leverage is statistically significant at either 1% or 5%, respectively. The positive sign suggests that firms' capital structure follows the same direction as their industry debt ratios. Our results also show that growth in GDP (GDP_GROW) has a positive effect on firms' capital structure. The results for both, PROFIT and GOVT_DEBT are negative, thus suggesting that they have a negative effect on a firm's capital structure.

In the comparison between stressed and non-stressed countries, results show that non-stressed countries have the same speed of capital structure adjustment at approximately 0.55 compared to the 0.45 of stressed countries. This result suggests that stressed countries have adjusted their capital structure more frequently compared to non-stressed countries. Firm size and asset tangibility are important in deciding the capital structure in both, stressed and non-stressed countries. The industry median leverage and GDP growth (GDP_GROW) are positively associated with the debt ratio in non-stressed countries. Surprisingly, only government debt has a significant impact on capital structure decisions in non-stressed countries.

Results reported in columns (2) to (6) show that lagged market value of debt, firm size, and asset tangibility are important and reliable determinants of capital structure for SMEs. Our results also suggest that a country's institutional factors matter and, in this regard, industry median leverage, GDP growth rate, and government debt levels are important.

Table 7, columns (7) to (11), reports the results for the dependent variable market value of the long-term debt ratio (MV2). Results for MV2 are similar to those reported for the dependent variable MV1. Results show that firm characteristics, such as lagged MV1 and asset tangibility are significant. In addition, a country's institutional factors, such as industry median leverage, GDP growth, and government debt are important in explaining capital structure in SMEs.

To check the reliability of the results reported in Table 5, Blundell and Bond's two-step system generalised method of moments (GMM) estimation was undertaken which allowed us to control for endogeneity by using lags of endogenous variables as instruments. Our results (not reported) are similar to those reported in Table 7 for the dependent variables MV1 and MV2.[6]

4.3 Robustness Check

Welch (2012) argues that capital structure theories typically focus on the actions of firms, but leverage ratio changes (dct, "debt-to-capital, total") are also influenced by corporate performance. A good approach is therefore to take out the part of leverage changes that is due to corporate performance (which is named dcp, "debt-to-capital passive"), and focus on

[6] If required, the GMM regression results can be obtained from the authors.

Table 5: Fixed Effects OLS Regression

MV1/MV2 is the dependent variable and L.MV1/MV2 are one period lags of the dependent variable, respectively. The measurement of the variables is reported in Table 2. Columns 2 and 6 report the regression results for the equation $D_{ij,t} = \alpha + \lambda D_{ij,t-1} + \sum \beta_j X_{ij,t-1} + \sum \gamma_k Z_{k,t-1} + \varphi_t Y_t + \delta_j C_j + u_{ij,t}$. Columns 2 to 6 and 7-11 report the regression results for the equation $D_{ij,t} = \alpha + \lambda D_{ij,t-1} + \sum \beta_j X_{ij,t-1} + \sum \gamma_k Z_{k,t-1} + \varphi_t Y_t + u_{ij,t}$

	MV1					**MV2**				
	2006-2013	**2006-2009**	**2010-2013**	**Non-stressed**	**Stressed**	**2006-2013**	**2006-2009**	**2010-2013**	**Stressed**	**Non-stressed**
Const.	15.849	0.026	0.033	0.042	0.042	-24.295	0.069	0.089	0.029	0.069
	(0.98)	(0.39)	(0.081)	(0.053)	(0.052)	(-1.58)	(0.137)	(0.086)	(0.112)	(0.051)
L.MV1 /MV2	**0.449*** **	**0.450*** **	**0.241*** **	**0.451*** **	**0.401*** **	**0.349*** **	**0.165*** **	**0.163*** **	**0.625*** **	**0.297*** **
	(20.46)	**(20.52)**	**(0.031)**	**(0.025)**	**(0.031)**	**(15.06)**	**(0.043)**	**(0.033)**	**(0.044)**	**(0.025)**
L.PROFIT	**-0.023****	**-0.023****	**-0.024****	**-0.030****	**-0.-219†**	-0.011	-0.005	-0.019	-0.022	-0.010
	(-2.12)	**(0.017)**	**(0.011)**	**(0.012)**	**(0.013)**	(-1.10)	(0.014)	(0.016)	(0.025)	(0.011)
L.SIZE	**0.013*** **	**0.027*** **	**0.013****	**0.015*** **	**0.016*** **	0.002	**0.011***	0.007	-0.001	0.001
	(0.004)	**(0.007)**	**(0.006)**	**(0.004)**	**(0.004)**	(0.60)	**(0.006)**	(0.006)	(0.004)	(0.004)
L.GROW	0.003	-0.0227	-0.005	0.009	-0.020	0.000	0.0016	0.004	-0.007	0.001
	(0.45)	(0.017)	(0.015)	(0.014)	(0.021)	(0.28)	(0.014)	(0.016)	(0.021)	(0.013)
L.TANG	**0.041****	**0.062†**	**0.035†**	0.037	**0.039****	**0.031†**	**0.031†**	**0.028****	0.0257	0.030
	(2.51)	**(0.037)**	**(0.023)**	(0.026)	**0.017)**	**(1.99)**	**(1.99)**	**(0.024)**	(0.017)	(0.019)
L.VOL	$-8.07*10^{-6}$	$-6.4*10^{-6}$	$2.48*10^{-5}$	$-1.2*10^{-5}$	-0.001	$-9.16*10^{-6}$	$-9.16*10^{-6}$	$1.59*10^{-5}$	-0.001	$-1.6*10^{-5}$
	(-0.20)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)

L.IND_MED	**0.131†**	**0.219****	**0.179†**	0.186	**0.186****	**0.116†**	**0.116†**	-0.028	**0.098†**	0.147
	(1.88)	**(0.103)**	**(0.108)**	(0.117)	**(0.0238)**	**(1.75)**	**(1.75)**	(0.114)	**(0.058)**	(0.091)
L.GDP_GROW	-0.576	0.1374	0.068	0.152	**0.152†**	0.289	0.289	**0.204†**	-0.526	**0.209****
	(-0.83)	(0.108)	(0.110)	(0.123)	**(0.084)**	(1.59)	(1.59)	**(0.108)**	(0.517)	**(0.091)**
L.GOV_DEBT	**-0.080****	**-0.052†**	-0.017	**-0.058****	-0.058	**-0.081****	**-0.081****	**-0.057****	-0.032	**-0.056*****
	(-2.59)	**(0.024)**	(0.029)	**(0.024)**	(0.051)	**(-2.75)**	**(-2.75)**	**(0.032)**	(0.052)	**(0.015)**
L.INFLA	-0.032	0.136	0.273	-0.107	-0.636	0.141	0.141	-0.038	-1.513	-0.168
	(-0.10)	(0.216)	(0.216)	(0.203)	1.329)	(0.50)	(0.50)	(0.231)	(1.341)	(0.189)
L.TAX	-0.008	0.078	**0.280†**	-0.102	-0.110	0.40	0.051	0.155	0.028	-0.169
	(-0.06)	(0.199)	**(0.168)**	(0.124)	(0.132)	(0.47)	(0.163)	(0.180)	(0.1470	(0.113)
L.S_GDP	-0.007	-0.005	-0.003	-0.004	-0.021	-0.005	0.017	0.003	0.002	0.002
	(-0.65)	(0.025)	(0.013)	(0.007)	(0.014)	(-0.48))	(0.021)	(0.014)	(0.014)	(0.007)
L.B_GDP	0.015	**0.082*****	0.002**	**0.080*****	**0.015****	0.011	0.006	-0.010	0.010	0.014
	(1.11)	**(0.024)**	(0.016)	**(0.011)**	**(0.013)**	(0.87)	(0.019)	(0.017)	(0.013)	(0.011)
Year & Country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
F stats (p value)	35.04(0.000)	271.07(0.000)	237.14(0.000)	336.86(0.000)	400.92(0.000)	16.83(0.000)	72.25(0.000)	142.94(0.000)	26.79(0.000)	68.28(0.000)
R^2 (0verall)	0.742	0.694	0.683	0.681	0.681	0.502	0.517	0.490	0.536	541
N	2142	918	1224	315	1827	2142	918	1224	315	1827

predicting the remainder (which is named dca, "debt-to-capital active"). To check the reliability of our results we did further regression analysis using debt-to-capital (DCA) as the dependent variable. The use of DCA is appropriate for leverage changes because it reduces the effect of changes in corporate performance, stock market-induced noise, and bias arising from stock market return irregularities (Welch, 2012). Results for DCA as the dependent variable are reported in Table 6. Some of the findings are consistent with the results reported in Table 5. We have also undertaken GMM regression and the results are reported in Table 7. Results reported in Table 7 are similar to those reported in Table 5.

Table 6: Regression Analysis of Debt-to-Capital as Dependent (DCA) Variable

DCA is the dependent variable and L.DCA is the lag of the dependent variable. $DCA = \frac{D_t}{D_t + E_t} - \frac{D_{t-1}}{D_{t-1+}E_{t-1}*(1+x_{t-1,t})}$.

	Whole Sample 2006-2016	No-Crisis 2006-2009	Crisis 2010-2013	Non-Stress	Stress
Const.	-10.808	-6.359	-13.132	0.603	-0.829
	[0.442]	[0.632]	[1.005]	[0.521]	[0.846]
L.DCA	**-0.163*** **	**-0.493*** **	**-0.492*** **	**0.507*** **	**-0.158*** **
	[0.023]	**[0.012]**	**[0.013]**	**[0.011]**	**[0.009]**
PROFIT	-0.520	-2.312	-0.293	0.227	0.839
	[1.122]	[0.762]	[1.962]	[1.371]	[0.142]
SIZE	1.241	1.889	0.547	-0.608	-0.345
	[0.589]	[0.446]	[1.033]	[0.684]	[0.290]
GROW	0.046	0.243	-0.081	0.0135	0.093
	[0.691]	[0.968]	[0.915]	[1.637]	[0.085]
TANG	**9.015** **	6.343	**-7.581** **	**12.46*** **	-0.783
	[2.163]	[2.387]	**[3.084]**	**[3.271]**	[0.995]
VOL	-0.001	-0.001	-0.001	-0.001	0.005
	[0.010]	[0.003]	[0.008]	[0.005]	[0.005]
IND_MED	-19.661	7.038	15.200	13.000	-0.243
	[9.977]	[7.364]	[21.11]	[10.91]	[0.032]
GDP_GROW	**-35.586**†	19.94	**30.44**†	**20.94**†	-0.058
	[10.28]	[28.15]	**[16.63]**	**[11.40]**	[0.472]
GOV_DEBT	1.889	0.229	-2.631	-0.714	-0.059
	[3.120]	[10.90]	[12.31]	[5.641]	[0.716]
INFLA	**35.181**†	**-53.63**†	-35.54	**-47.00**†	0.228
	[21.88]	**[31.19]**	[30.12]	**[24.32]**	[0.286]
TAX	16.542	10.61	**-79.18**†	-1.197	0.855
	[18.59]	[11.00]	**[47.98]**	[22.16]	[0.316]

F stats	5.99	18.66	20.21	23.65	21.76
(p value)	(0.000)	[0.000]	[0.000]	[0.000]	[0.000]
N	2142	918	1224	1701	441

Robust standard errors are in parenthesis. *** Significance at 1%level, ** Significance at 5%, and † Significance at 10%

4.4 Impact of Institutional Factors on Adjustment Speed

The impact of institutional factors on small and medium capitalised firms' capital structure adjustment speed was undertaken in two stages. In the first stage values derived from equation (1) given below were used to estimate β which was used to calculate the target leverage ratio ($\widehat{D*}_{ij,t}$) and deviation from the target leverage ($\widehat{DEV}_{ij,t}$). Equation (1) is given below.

$$D_{ij,t} = \alpha + \lambda D_{i,t-1} + \sum \beta_j X_{ij,t-1} + \sum \gamma_k Z_{k,t-1} + \varphi_t Y_t + \delta_j C_j + u_{ij,t} \quad (1)$$

The estimate of β was used to calculate the target leverage ratio ($\widehat{D*}_{ij,t}$) and deviation from the target leverage ($\widehat{DEV}_{ij,t}$) for each firm-year as given in equation (2).

$$\widehat{D*}_{ij,t} - D_{it,t-1} = \widehat{DEV}_{ij,t} \quad (3)$$

where $\widehat{D*}_{ij,t} = \beta_j X_{ij,t-1}$

In the second stage, the estimated deviation of the target leverage ratio ($\widehat{DEV}_{ij,t}$) was substituted into equation (4) below to produce estimates for the determinants of a firm's adjustment speed:

$$\widehat{DEV}_{ij,t} = \alpha + \lambda \widehat{DEV}_{ij,t-1} + \rho I_j + \pi M_j + \partial F_j + \varphi_t Y_t + \delta_j C_j + u_{ij,t} \quad (4)$$

where I is a vector of an index of national institutional factors. M is a vector of time-varying macroeconomic variables (GDP growth rate, Government Debt), F is a vector of financial development (stock and bond market capitalization) as control variables, Y is a vector of year-fixed effects, C is a vector of country fixed effects.

Results for equation (3) are reported in Table 8. This result provides direct evidence of the effect of institutional factors on cross-country differences in adjustment speeds. Our results show that a country's institutional factors are important for the speed of adjustment of capital structure in small and medium capitalised firms in Europe. However, some institutional factors have a greater influence on the speed of adjustment compared to other factors. For example, a one-standard-deviation increase in voice and accountability (VnACC) and regulation quality (REGQUAL) increases a typical firm's adjustment speed by 8.3% and 9.3%. Overall, our results show that institutional factors are important for firms adjusting to the optimal (target) capital structure.

4.4 Impact of Institutional Setting on Capital Structure

To investigate how the institutional environment of a country affects small and medium capitalised firms' capital structure, the regression analysis is undertaken in two stages. In the first stage (unreported), equation (1)

$$D_{ij,t} = \alpha + \lambda D_{i,t-1} + \sum \beta_j X_{ij,t-1} + \sum \gamma_k Z_{k,t-1} + \emptyset_{ij} F_i + \varphi_t Y_t + \delta_j C_j + \tau(C_j * Y_t) + u_{ij,t} \quad (5)$$

Table 7: GMM Regression Results

MV1/MV2 are the dependent variable and L.MV1/MV2 are one period lags of the dependent variable, respectively. The measurement of the variables is report in Table 2. Columns 2 and 6 report the GMM regression results for the equation $D_{ij,t} = \alpha + \lambda D_{ij,t-1} + \sum \beta_j X_{ij,t-1} + \sum \gamma_k Z_{k,t-1} + \varphi_t Y_t + \delta_j C_j + u_{ij,t}$. Columns 2 to 6 and 7-11 report the GMM regression results for the equation $D_{ij,t} = \alpha + \lambda D_{ij,t-1} + \sum \beta_j X_{ij,t-1} + \sum \gamma_k Z_{k,t-1} + \varphi_t Y_t + u_{ij,t}$

	MV1					MV2				
	2006-2013	**2006-2009**	**2010-2013**	**Non-stressed**	**Stressed**	**2006-2013**	**2006-2009**	**2010-2013**	**Non-stressed**	**Stressed**
L.MV1/MV2	**0.592*** [0.061)**	-0.354 [0.275]	**0.601** [0.216]**	**0.610*** [0.086]**	Dropped Due to insufficient data	**0.583*** (0.99)**	0.077 [0.345]	**0.550** [0.218]**	**0.534*** [0.123]**	Dropped Due to insufficient data
L.PROFIT	-0.011 [0.013]	0.007 [0.073]	-0.045 [0.045]	-0.025 [0.016]		-0.005 (-0.50)	0.003 [0.063]	-0.022 [0.037]	-0.009 [0.013]	
L.SIZE	**0.024** [0.012]**	0.029 [0.033]	0.026 [0.035]	**0.051*** [0.014]**		**0.018† (0.010)**	**0.062† [0.032]**	-0.005 [0.022]	0.013 [0.012]	
L.GROW	0.007 [0.011]	-0.027 [0.029]	0.001 [0.043]	0.004 [0.010]		0.004 (0.47)	-0.032 [0.233]	0.029 [0.041]	-0.002 [0.008]	
L.TANG	0.126 [0.081]	0.096 [0.203]	0.097 [0.182]	0.040 [0.073]		0.075 (0.067)	0.144 [0.144]	-0.066 [0.155]	0.118 [0.084]	
L.VOL	$1.64*10^{-5}$ [0.000]	$2.30*10^{-4}$ [0.001]	$3.34*10^{-5}$ [0.000]	$-8.52*10^{-6}$ [0.000]		$1.61*10^{-5}$ (0.73)	$2.54*10^{-4}$ [0.001]	$5.44*10^{-5}$ [0.000]	$1.09*10^{-5}$ [0.000]	
L.IND_MED	0.533 [0.337]	**1.218*** [0.254]**	**1.731† [1.75]**	**0.834*** [0.211]**		0.551 (0.328)	**0.675** [0.225]**	0.734 [0.767]	**0.539** [0.217]**	

L.GDP_GROW	-0.209 [0.285]	1.556 [1.791]	**-1.326†** **[0.718]**	**0.679***** **[0.154]**		**0.620**** **(0.285)**	1.925 [1.434]	-0.345 [0.605]	**0.375**** **[0.146]**	
L.GOV_DEBT	-0.054 [0.048]	0.655 [0.484]	-0.045 [0.121]	-0.009 [0.025]		**-0.085†** **(0.049)**	0.475 [0.319]	-0.108 [0.146]	-0.086 [0.026]	
L.INFLA	**0.882**** **[0.017]**	-1.600 [2.93]	-2.371** [1.05]	-0.061 [0.298]		**1.056†** **(0.617)**	-0.423 [2.568]	0.826 [1.084]	-0.158 [0.286]	
L.TAX	**-0.471**** **[0.233]**	**-0.843**** **[0.396]**	0.712 [0.494]	**-0.534**** **[0.227]**		-0.130 (0.197)	**-0.651**** **[0.329]**	-0.836 [0.619]	-0.373 [0.252]	
L.S_GDP	**-0.047**** **[0.016]**	-0.008 [0.056]	0.006 [0.-26]	0.010\ [0.011]		-0.022 (0.010)	-0.027 [0.051]	**0.055†** **[0.028]**	0.019 [0.014]	
L.B_GDP	-0.041 [0.029]	**0.211**** **[0.077]**	-0.185** [0.091]	0.069*** [0.017]		0.019 (0.028)	0.026 [0.062]	0.066 [0.102]	0.006 [0.019]	
Year & Country FE	yes	yes	yes	yes		yes	yes	yes	yes	
F stats (p value)	16.49 (0.000)	7.45 (0.000)	3.30 (0.000)	11.42 (0.000)		6.26 (0.000)	2.91 (0.001)	3.71 (0.000)	3.63 (0.000)	
N	1836	612	612	1332		1836	612	612	1332	

Table 8: Effect of Institutional Factors on Adjustment Speeds

$\widehat{DEV}$ is the deviation of leverage, the difference between optimal leverage and observed leverage. Each column in the table represents a separate estimation in the second stage regression and reports the coefficient estimates after controlling for country and year fixed-effects. Standard errors are bootstrapped to account for generated regressors. Variable definitions are provided in Table 2.

	$\widehat{DEV}$						
Const.	**-0.511**** **[0.198[**	-0.218 [0.153]	-0.055 [0.083]	**-0.218**** **[0.110]**	**-0.301**** **[0.146]**	**-0.301**** **[0.146]**	0.024 [0.103]
L.DEV	**0.403***** **[0.024)**	**0.403***** **[0.024]**	0.407 [0.024]	**0.409***** **[0.023]**	**0.401***** **[0.024]**	**0.401***** **[0.023]**	**0.407***** **[0.023]**
VNACC	0.092 [0.088)	0.108 [0.076]					
POLSTAB	0.014 [0.028)		0.019 [0.023]				
GOVEFF	**0.075**** **[0.036]**			**0.083**** **[0.034]**			
REQUAL	**0.070**** **[0.053]**				**0.093**** **[0.043]**		
ROL	0.034 [0.046]					0.011 [0.041]	
CORRUPT	-0.057 0.042]						-0.027 [0.035]
GDP_Grow	**0.507**** **[0.266]**	**0.378**† **[0.214]**	0.337 [0.213]	**0.413**** **[0.211]**	0.202 [0.208]	0.291 [0.205]	0.311 [0.206]
GOV_Debt	**0.084**** **[0.042]**	**0.113**** **[0.039]**	**0.093**** **[0.036]**	**0.075**** **[0.344]**	**0.101**** **[0.037]**	**0.092**** **[0.036]**	**0.082**** **[0.038]**
INFLA	**-0.667**† **[0.344]**	-0.523 [0.349]	-0.550 [0.355]	-0.508 [0.344]	-0.522 [0.344]	**-0.637**† **[0.342]**	**-0.667**** **[0.344]**
StockCap	**0.022** **[0.025]**	-0.001 [0.014]	**-0.002** **[0.014]**	**0.005** **[0.014]**	0.013 [0.015]	-0.001 [0.015]	-0.001 [0.014]
BondCap	0.006 [0.018]	-0.019 [0.020]	-0.022 [0.021]	-0.007 [0.021]	-0.007 [0.022]	-0.027 [0.020]	-0.031 [0.019]

Country & year FE	yes	yes	yes	yes	yes	yes	yes
F stats	22.76	31.30	31.16	31.68	31.58	31.58	31.16
(P-Value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	1836	1836	1836	1836	1836	1836	1836

where time-varying country-level estimates by using equation (6) as follows: $\mu C_{jt} = \delta C_j + \varphi Y_t + \tau_{j,t}(C_j * Y_t)$ are derived to examine whether variations in capital structure can be explained by institutional factors. In the third stage, I_{jt} time − varying institutional factors (ROL, VNACC, POLSTAB, GOVEFF, REQUAL, CORRUPT), M_{jt} are the time-varying macroeconomic variables (GDP_GROW, GOV_DEBT) and financial development indicators (stock and bond market capitalisation), Y_i is the year-fixed effect:

$$\mu C_{jt} = \rho I_{jt} + \partial M_{jt} + \gamma_t Y_t \quad (7)$$

Results for equation (4) are reported in Table 9. This result provides direct evidence of the effect of institutional factors on cross-country differences in capital structure. Our results show that a country's institutional factors are important for the changes in a firm's capital structure. However, some institutional factors have a greater influence than other factors.

Table 9: Effect of Institutional Factors on Capital Structure

Each column in the table represent a separate estimation. In the first stage, equation (5) $D_{ij,t} = \alpha + \lambda D_{i,t-1} + \sum \beta_j X_{ij,t-1} + \sum \gamma_k Z_{k,t-1} + \emptyset_{ij} F_i + \varphi_t Y_t + \delta_j C_j + \tau(C_j * Y_t) + u_{ij,t}$ **was used to estimate the parameters. In the second stage, equation (6) was used to determine the value of** $\mu C_{jt} = \delta C_j + \varphi Y_t + \tau_{j,t}(C_j * Y_t)$. **In the third stage, equation (7)** $\mu C_{jt} = \rho I_{jt} + \partial M_{jt} + \gamma_t Y_t$ **was used as follows and we report the coefficient estimates from country-random-effects regressions. Standard errors are bootstrapped to account for generated regressors. Variable definitions are provided in Table 2.**

	μC_{jt}						
Const.	**-19.816*** [0.001]**	**-19.817*** [0.001]**	**-19.800*** [0.001]**	**-19.799 [0.001]**	**-19.794*** [0.001]**	**-19.798*** [0.001]**	**-19.800*** [0.001]**
VNACC	**0.010*** [0.000]**	**0.010*** [0.003]**					
POLSTAB	**-0.001*** [0.000]**		**0.001*** [0.001]**				
GOVEFF	**-0.002** [0.002]**			**-0.001*** [0.001]**			
REQUAL	**-0.003*** [0.001]**				**-0.002*** [0.001]**		
ROL	**-0.004*** [0.002]**					**-0.002*** [0.001]**	
CORRUPT	**0.004*** [0.002]**						**0.001*** [0.001]**
GDP_Grow	**0.001 [0.001]**	**0.013*** [0.001]**	**-0.005*** [0.001]**	**-0.007*** [0.001]**	**-0.007*** [0.001]**	**-0.007*** [0.001]**	**-0.009*** [0.001]**
GOV_Debt	**-0.002*** [0.002]**	**-0.004*** [0.001]**	**-0.006*** [0.000]**	**-0.006*** [0.000]**	**-0.007*** [0.002]**	**-0.006*** [0.000]**	**-0.005*** [0.002]**
INFLA	**0.027*** [0.003]**	**-0.006*** [0.001]**	**-0.009*** [0.002]**	**-0.011*** [0.002]**	**-0.014*** [0.002]**	**-0.014*** [0.002]**	**-0.007*** [0.002]**
StockCap	**-0.001*** [0.000]**	**-0.001*** [0.000]**	**-0.002*** (0.002)**	**-0.001*** (0.000)**	**-0.003*** (0.000)**	**-0.001*** (0.001)**	**0.005*** (0.001)**
BondCap	**0.02****	**0.001***	**-0.001***	**-0.004***	**-0.001***	**-0.001***	**-0.001***

	(0.001)	**[0.000]**	**(0.001)**	**(0.001)**	**(0.000)**	**(0.000)**	**(0.002)**
Wald $\chi 2$	18977.54	25403.53	29565.96	27916.09	29565.96	29543.13	29808.71
(P-Value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	2448	2448	2448	2448	2448	2448	2448

5 Discussion

The results for asset tangibility (TANG) suggest that it is a strong determinant of capital structure, regardless of period and country. The positive relationship implies that SMEs with high fixed assets use more debt in their capital structure. This result suggests that the more fixed assets SMEs have, the more willing banks are to give loans to SMEs that can pledge fixed assets as collateral, or guarantee against borrowings. Our results for TANG are consistent with those reported by Gaud et al. (2005), De Jong et al. (2008), Frank and Goyal (2009), and Benkraiem and Gurau (2013).

Firms' growth (GROW) and volatility (VOL) did not have a significant impact on the decisions of capital structure in all results. The results for GROW show a similar pattern to the results reported by De Verinam and Levin (2012), that firms that decrease their leverage do not necessarily have a faster growth rate. In terms of VOL, its relationship with capital structure does not follow any theory discussed in the literature; that is, the capital structure will be negatively influenced by firms' earnings volatility. However, Benkraiem and Gurau (2013) examined the case of French SMEs and reported an insignificant impact of volatility. The results indicate that a firm's growth and volatility both have weak explanatory power to be considered for the capital structure decisions of European SMEs during the government debt crisis.

Profitability was an important determinant of the capital structure during the non-crisis period from 2006-2009 (Table 5 and for SMEs in stressed companies (Table 5). This can be interpreted as follows: as profitability continues to deteriorate, its fluctuation has a more significant impact on the capital structure decisions of stressed firms compared to non-stressed firms. The negative coefficient of profitability suggests that more profitable firms tend to use less debt. This evidence agrees with the pecking order theory that firms prioritise their internal funding resources. This result is similar to that reported by Booth et al. (2001), Gaud et al. (2005), Benkraiem and Gurau (2013).

The results for SIZE suggest it had a significant impact on debt for the pre-crisis period and the SMEs in non-stressed countries. The negative relationship indicates that large firms seem to have more equity than debt in their capital structure in comparison to SMEs. During financial distress, size does not matter for SMEs in deciding the mix of debt and equity. Our result for SIZE is different from the predictions of the trade-off theory. Large firms tend to borrow more as they have a lower cost of debt and lower risk of default. However, our findings for SIZE are similar to those reported by Kremp, Stöss, and Gerdesmeier. (1999) and Rajan and Zingales (1995) investigated the case of German firms and documented a negative link between capital structure and SIZE. These authors argue that the German bankruptcy law and the bank system provide creditors better protection, thus making them willing to lend to firms regardless of their sizes.

The industry median leverage (IND_MED) has a very important role for European SME firms in identifying their capital structure. The results for IND_MED are stable and have a strong effect across periods and for groups of countries. The statistically significant positive coefficient indicates that SMEs use industry leverage as the benchmark to build the capital structure. Hence, it can be concluded that SMEs' capital structure will move in the same direction as the industry median leverage level. The result for industry median leverage is in line with that reported by Flannery and Rangan (2006) and Frank and Goyal (2009).

Among the macroeconomic factors, GDP_GROW has the strongest impact on firms' capital structure. In all the regressions, GDP_GROW is significantly correlated to the debt ratio. According to Bokpin (2009), high GDP growth stimulates firms' business operations, which enables them to increase the level of retained earnings and, therefore, internal funding resources.

Government debt level (GOV_DEBT) has important implications for the choice of the capital structure during both periods of pre-crisis and during the crisis. The higher government debt levels are, the lower the firm's leverage is. A difficulty in a government's situation makes it a less favourable environment for firms to issue bonds or borrow from banks. They tend to use their internal sources rather than external sources. There is not much previous literature that examines government debt ratio in relation to the determinants of capital structure. Alves and Francisco (2013) claimed first to analyse gross government debt in relation to firms' capital structure. Although they found a positive relationship between government debt and long-term debt level, they also found a negative relationship between government debt and short-term debt. They anticipated that the deleveraging process would happen soon. Recently, Kanda and Iqbal (2014) confirmed that the increase in sovereign debt reduced the value of a firm's debt. Therefore, the regression results relating to the government debt level in this paper are consistent with earlier studies.

Inflation is positively related to the leverage ratio in both groups of countries, as well as for the total sample and the pre-crisis period. Frank and Goyal (2009) show similar findings. Inflation is expected to be high, leading to an increase in the real value of tax reduction on debts (Frank & Goyal, 2009). Hence, according to the trade-off theory, inflation has a positive relationship with the leverage ratio.

Results reported in Table 7 suggest that institutional factors are important for SMEs adjusting their capital structure. The nature of the institutional factors matters; that is, a weaker institutional factor leads to slower adjustment compared to a strong institutional factor. Results reported in Table 8 suggest that the country's institutional environment plays an important part in how SMEs make capital structure decisions.

6 Conclusion and Policy Implications

Since the introduction of the Modigliani-Miller capital structure irrelevance theory, the number of studies relating to the determinants of capital structure has significantly increased. This study has addressed three main gaps and contributed to the current literature on capital structure. Firstly, most previous papers focused on the determinants of the capital structure of large corporations. This study fills the gaps by investigating the case of SMEs. Secondly, only a few studies have considered the effect of industry and macroeconomic factors compared to the firm-specific determinants of capital structure. This paper undertook a comprehensive analysis of the combination of the determinants of capital structure at three levels: firm, industry, and country.

The results indicate that European SMEs adjusted their capital structure during the sovereign debt crisis and the speed of adjustment was quicker for non-stressed countries than for stressed countries. While SMEs from non-stressed countries tended to reduce their leverage ratio, the leverage ratios of SMEs from stressed countries increased during the sovereign debt crisis. In terms of the determinants of capital structure, the nature of assets, industry median leverage, and growth in GDP has had important effects on capital structure decisions. Asset tangibility and industry-related factors had positive relationships with firms' leverage ratios. Conversely, firms' growth and volatility did not show significant impacts on the choice of European SMEs' capital structure. Profitability became an important determinant of the capital structure during the crisis period from 2010-2013 and for SMEs in stressed countries. In contrast profitability and firm size demonstrated a significant impact for the pre-crisis period and for the group of SMEs in non-stressed countries. The government debt level showed an important implication for the choice of the capital structure during both pre-crisis and during-crisis periods. Finally, we caution readers from generalising the findings of this study as our sample size is small and the study is based only on the sovereign debt crisis.

6.1 Policy Implications

The findings of this study have policy implications for European countries and the European Commission. Since SMEs play an important economic and social role in society, implementing appropriate policies will ease the financial difficulties of SMEs' and help boost SMEs' performance, and in turn contribute to the economy, especially in the relatively less developed EU member states (like Greece). For SMEs to be able to obtain an optimal capital structure, the attitude of banks towards small-sized firms should change so that it is easier to access funds quickly to finance operations and capital expenditure. The government of member countries could also provide credit guarantees so that SMEs could easily adopt new technologies. Start-up companies require assistance with training and mentoring. Governments could facilitate an environment where new entrepreneurs can get the help needed. In addition, SMEs could be provided training/advice so that they can easily adopt new instruments such as factoring, leasing, venture capital financing, and fintech. This will enable SMEs to lower their short-term financing costs and also grow without burdening themselves with excess debt. Since profitability is negatively related to debt, a lower tax rate would help generate cash flows which could be used to finance immediate needs and enable SMEs to return to a comfortable level of capital structure. The policymakers could design and implement effective regulations, which balance financial stability, and investors' protection and opens up new financing channels for SMEs.

Since institutional factors such as governance, rule of law, and corruption are negatively associated with the capital structure, strengthening these factors will enable SMEs to perform better and in turn, contribute to the capital market and financial market. Regulatory reforms are needed to make the financial sector safer for investors. The policymakers incentivise capital market participants to take a longer-term approach and offer additional services to growth-oriented entrepreneurs. In addition, this will also assist SMEs to maintain a healthier capital structure in the future. Since the main issue faced by the SME sector is the asymmetry of information, having an efficient financial and capital market will assist in reducing the barrier faced by SMEs. In addition, SMEs developing a good relationship with their banks will also assist them in acquiring financing when needed and also reduce the need for additional collateral pledges. Creating the public equity platform for SMEs will also support the development of other, non-traditional SME equity instruments such as equity private placements, equity crowdfunding, listed funds, and corporate venturing. Addressing information asymmetries and increasing transparency in the markets will also boost the development of alternative financing instruments for SMEs.

Since increased competition in the EU integrated markets and as well as the global market will exert pressure on SMEs' profit margins, training assistance in terms of operations, administration, financing, logistics, and new technology adoption will help to improve the efficiency and effectiveness of SMEs.

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