SMEs' Capital Structure and Determinants in Europe: Evidence from the Sovereign Debt Crisis

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Abstract

This study investigates the adjustment that European SMEs have made to their capital structure and the factors that affect their capital structure decisions before and during the sovereign debt crisis period. Macroeconomic factors, industry-level and firm-level variables are examined in relation to the SMEs' debt levels. The sample includes 2,448 firm-year observations of 306 firms in 10 European countries for the period 2006 to 2013. Results indicate that European SMEs have adjusted their capital structure during the sovereign debt crisis period and the speed of adjustment was quicker for non-stressed countries than for the stressed countries. Whilst SMEs from non-stressed countries have reduced their leverage, the ratios of SMEs from stressed countries have increased during the crisis period. Our findings suggest that profitability was an important determinant of capital for SMEs during the crisis period of 2010-2013 and for the stressed companies. Size of SMEs shows significant implication for the choice of capital structure for the pre-crisis period and the non-stressed countries. Government debt level had a significantly negative effect on the leverage during the period examined and inflation had a positive effect on leverage in both stressed and non-stressed countries and as well as for the pre-crisis period.

Keywords: Leverage, SMEs, capital structure, Sovereign debt crisis, Stressed country, non-stressed country

GEL Classification: G20, G32

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1 Introduction

Since Modigliani and Miller (1958) proposed the capital structure irrelevance theory, voluminous research relating to the determinants of capital structure have evolved that argues the relevance of capital structure. Research that followed argued against the neutrality of money concept proposed by Modigliani and Miller (1963) and reported that capital structure decisions have an effect on firm value. Managers need to carefully consider the mix of debt and equity for funding new projects, as their decision has potential to affect the value of the firm.

Nearly six decades after Modigliani and Miller (1958), theory of capital structure remains one of the controversial issues in corporate finance and the question "how firms choose their capital structure?" still remains unanswered. Although there is dominance of evidence supporting firm characteristics to be important (see Benkraiem & Gurau, 2013; Hall, Hutchinson & Michaelas, 2004; Harris & Raviv, 1991), a lack of evidence regarding the impact industry-level and country-level determinants have on capital structure decisions. In addition, most of the results regarding the determinants of capital structure relate to large firms and scant research exists regarding small and medium size (SMEs) firms. The inconsistent evidence relating to the factors that influence capital structure across firms and countries suggests that country's institutional factors play an important role in determining firm's choice of capital structure.

Therefore, this research contributes to the literature by examining the factors that affect the choice of capital structure at three different levels, that is, firm-level, industry-level and country-level. Moreover, the focus this study is on the determinants of capital structure of the small and medium-sized firms (SMEs) which has not been the focus of prior researchers. SMEs play an important part in the economy. The SME User Guide (2005) provided by the European SME Centre notes that SMEs create jobs, entrepreneurial spirit, innovations and are also necessary for fostering competitiveness and employment. According to the statistics for the European Commission provided by the User Guide, among European Union's (hereafter EU) 25 members, there are around 23 million SMEs, which represent 99% of all EU firms and employees about 75 million people.

However, no universal definition exists for SMEs across countries. SMEs are mainly defined based on the following criteria: staff headcount, annual turnover or value of the total assets in the balance sheet. For example, SMEs in the US are defined as the enterprises with less than 500 employees. However, SMEs in developing countries tends to be smaller. For example, Vietnam identifies SMEs as having less than 300 employees while Singapore defines SMEs as having less than 200 employees. The European Commission divides SMEs into micro, small and medium-sized firms. In 2005, the European Commission made a major adjustment to the definition of SMEs to reflect the general economic developments since 1996. Specifically, in the EU, micro enterprises have fewer than 10 employees and have annual turnover or annual balance sheet total of less than 2 million euros. Small enterprises are companies, which have fewer than 50 staffs and annual turnover or annual balance sheet total of not over 10 million euros. Medium-sized firms employ fewer than 250 persons and have annual turnover not exceeding 50 million euro, or total assets in the balance sheet not exceeding 43 million euros.

Despite the importance of SMEs for the economies, SMEs face many challenges regarding accessing finance. In contrast to large firms, SMEs find it difficult to obtain loans from banks and/or funds from investors. Several important reasons constraining SMEs' access to both equity and debt market are discussed by Malhotra (2007). For example, small loan size and large transaction cost make banks reluctant to lend money to SMEs. Another reason is that it is difficult to obtain reliable financial information for SMEs. SMEs often do not have transparent financial and accounting systems and there is a lack of verification from third parties such as external auditors. Moreover, SMEs often do not have collateral to pledge against loans as well. For the reason stated above, SMEs are deemed too riskier by banks compared to large firms. Higher interest rates and rigorous assessment of credit are further obstacles faced by SMEs in securing external funds. A survey undertaken by the European Commission highlights that 42% of SMEs felt that it was less easy to obtain borrowings from banks, 71% of them shared the view that banks did not want to take risks in giving money to SMEs and 60% of firms needed lower interest rate and less demanding guarantee requirements. The difficulties faced by SMEs in generating external sources of funds are exacerbated during the times of financial crisis.

We have witnessed a number of different financial crises since 1997, namely the 1997 Asian Financial Crisis, 2007 the Global Financial Crisis (hereafter GFC) and the burgeoning Sovereign Debt Crisis. Similar to the devastating effect of GFC on economies, the sovereign debt crisis also had severe effect on the economies of the Eurozone countries. The sovereign debt crisis that started in the spring of 2010 have disrupted the financial markets and economic activities. As the cost of borrowing increased and credit standards became tighter, economic confidence fell to the lowest levels (Lane, 2012). In terms of the capital supply-side, bank lending shrunk, as well as, investors became reluctant to buy corporate bonds or firms' equity. For SMEs, the economic downturn made it harder to conduct businesses and consequently, led to decline in earnings.

The effect of sovereign debt crisis was much more severe on the SMEs than on large firms, credit funding dried up faster for SMEs compared to the large firms (Wehinger, 2014). How sovereign debt crisis have affected SMEs' managers behaviour, especially relating to the management's choice of capital structure is not well understood. Whether the changes in the macroeconomic and microeconomic conditions during the sovereign debt crisis period have forced managers to reconsider the level of debt and equity in their capital structure, remains an empirical question. In this regard, the sovereign debt crisis provides an interesting case study to examine how the managers' decisions have affected the determinants of capital structure choices of the European SMEs.

Since euro was introduced without establishing mechanisms to cope with the debt crisis, the one-size-fit-all monetary policy have proved to have its weaknesses. According to Mody and Sandri (2012), interest rate set by the European Central Bank (ECB) has had different effect on Eurozone member countries. Although low interest rate had a positive effect on large countries such as Germany and France facing weak growth, the emerging countries such as Greece, Ireland or Spain had devastating effect. Moreover, lost confidence and difficulty in assessing of risks are two other reasons for the sovereign debt crisis. For example, Greece, Portugal, Spain and Italy could borrow funds at the low interest rate. It was assumed by the financial markets that every country in Eurozone have the same risk of default. When the crisis started, investors realised that countries with high debt burden and weak economies should pay higher borrowing costs. The lack of control on government spending with expansionary fiscal policies in the countries

with low competitiveness also contributed to the severity of the crisis (Young & Semmler, 2011). According to Lane (2012), most of the research relating to the debt crisis tends to focus only on finding the causes, effects and solutions for the EU. In the context of the sovereign debt crisis, the firms' choice of capital structure encountered more challenges and became more complex. However, the studies relating to how the sovereign debt crisis have affected firms' choice of capital structure and its determinants have not received enough attention from the scholars.

Therefore, the objectives of this study are as follows: (i) examine whether European SMEs have adjusted their capital structure during the sovereign debt crisis period; (ii) investigate what factors affect their choice of debt and equity decisions in this period; and (iii) compare the findings across groups of countries and sub-periods.

The study contributes to the literature on corporate finance in several ways. First, the European sovereign debt crisis period is interesting as it occurred right after the global financial crisis, and the findings of this study will show whether managers change their capital structure decisions during the crisis period. Second, this study focuses on the firm-level, industry-level and country-level factors that are important for decisions regarding capital structure. Last, focus of prior researchers has been on large firms and our understanding of the determinants of capital structure of SMEs is not well understood.

The structure of this study is organised as below. Section 2 provides a brief review of the literature relating to capital structure theories, capital structure under the crisis and determinants of capital structure in large firms and SMEs. 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

Modigliani and Miller (hereafter MM) (1958) argued that in a perfect market the value of a firm is not affected by the combination of the debt and equity in their capital structure, as value is created from the earnings and risk of underlying assets. However, MM proposition proved to be controversial as it was based on

unrealistic assumptions and ignored implications of taxes, bankruptcy costs, asymmetric information, and heterogeneous expectations. Although MM (1963) revisited their proposition of 1958 by incorporating the effect of corporate taxes and tax deductions on interest payments, it proved to be unrealistic as they have implied that firms could maximise value by employing only debt financing.

As a consequence, a number of the studies have evolved that argue using alternative theories, such as, the trade-off theory, the agency cost theory, the pecking order theory, the market timing theory and the signalling theory, regarding the relevance of capital structure when the capital markets are imperfect. Myers (1994) postulated the trade-off theory. The trade-off theory takes account of factors such as bankruptcy cost and asymmetric information and requires managers to trade-off the costs of debt and equity. The trade-off theory is further divided into the static trade-off theory and the dynamic trade-off theory. According to the static trade-off theory, an optimal capital structure exists for each firm based on the trade-off between the benefits and costs of debt. The advantage of using more debt comes from the positive effect of the interest tax shield. However, increasing debt levels could lead to bankruptcy costs. Kane, Marcus and McDonald (1984) and Brennan and Schwartz (1984) advanced the dynamic capital structure model with consideration of uncertainty, tax and bankruptcy costs. The dynamic trade-off theory indicates that the financing margin and expectations for the coming period helps to determine the level of debt and equity to be used. For example, some firms expect to pay back debt while others want to retain capital for future projects. In other words, firms that have optimal capital structure are less sensitive to the movement in the short-run equity compared to the changes in their long-run value.

The agency cost is one of the major problems in capital structure decisions. The agency cost theory postulated by Jensen and Meckling (1976) suggest that the conflict between the agent and the principal have an impact on capital structure behaviour. Because of the separation between agent (manager) and principal (shareholder), managers tend to make decisions that benefit themselves rather than their shareholders. For example, managers tend to invest in risky or unwarranted projects instead of paying free cash flow to the investors (Iqbal, Muhammad, Muneer & Jahanzeb, 2012). However, SMEs tend to suffer less from the *Agency Issue* because in the case of SMEs, very often the owner and manager

turns to be the same person. In this regard, the family or small firms have zero agency cost (Ang, Cole & Lin, 2000; Anderson & Reed, 2003; McConaughy, 2000).

Myers and Majluf (1984) introduced the pecking order theory (POT). Contrary to the trade-off theory, the POT proposes that there is no optimal capital structure for any firm but there is an order or preference for managers to choose the funding sources. POT focuses on the problem of asymmetric information between the managers and outside stakeholders. As the investors do not have all the available information, they tend to discount the company's share price. In order to minimise the effect of information asymmetry, firms first use the internal resources of funds such as owners' capital and retained earnings. Cases where the internal sources of funds are insufficient to finance projects managers use debt and issue stocks, as the last resort. The POT is relevant to SMEs because most SMEs use their internal sources of funds first as it is difficult to obtain external funds due to the lack of information (Ang, 1991; Holmes & Kent, 1991; Cosh & Hughes, 1994).

Baker and Wurgler (2002) studied the relation of the firms' choice of capital structure with market condition and reported that managers issue debt or equity based on the market condition. Shares are issued when the share price is overvalued and bought back when the shares are undervalued, while bonds are issued when interest rates are low. When the market is not favourable, managers can defer increasing capital with debt or equity. Therefore, the current capital structure of firms is the cumulative result of managers' efforts to time the market. Baker and Wurgler (2002) argue that the effect of market timing on capital structure is steady and continuous. Although this theory does not provide much suggestions about the traditional determinants of capital structure, it does indicate that stock returns and debt market conditions affect managers' decisions regarding the choices of capital structure.

The concept of signalling emphasises that good firms can be differentiated from bad ones by transmitting reliable signals to the capital markets (Spence, 1973). Ross (1997) argued that debt could be utilised as costly signal to separate good firms from bad ones. Similar to the POT, the signalling theory takes into account the asymmetric information problem. Since the company specific information is asymmetric to insiders and outsiders the indications from firms are essential for the investors. The investors perceive the issuance of debt as showing an optimistic

future and firms that have more leverage are considered to be of high quality. Hence, the investors react negatively to the announcement of equity issuance (Brealey, Leland & Pyle, 1977).

Last six decade of studies relating to the capital structure theories, a large number of studies have reported support for the trade-off theory and pecking order theory. However, there seems to be a lack of consensus among researchers. Among the theories discussed above, the POT seems to be the most appropriate for SMEs' choice of capital structure. Although SMEs are less influenced by the agency cost (Jensen & Meckling, 1976), asymmetric information tends to be the biggest issue for them. Barnea, Haugen and Senbet (1980) argue that SMEs have more asymmetric information problem, which makes it harder for them to get access to external finance such as bank loans or through share market. As a result, internal financing sources such as owner's capital and retained earnings are utilised more often. In addition, to examine whether firms adjust their capital structure during the crisis period, the trade-off theory is relevant as it suggest that firms have an optimal or target capital structure.

Capital structure and financial crisis

Doukas, Guo, and Zhou (2011) reported that firms use more debt when the equity market is out of favour, despite the high cost of adverse selection in the debt market. During the economic expansionary periods, the adverse selection cost of equity tends to be less than the cost of debt and decrease in the adverse selection cost of equity leads to an increase in the equity issuance (Choe, Masuslis, & Nanda, 1993; Dittmar & Dittmar, 2008).

Deesomsak, Paudyal and Pescetto (2004) collected data from Australia, Malaysia, Singapore and Thailand, for 1993 to 2001 period and reported that leverage ratios rose significantly after 1997 Asian Financial Crisis, but the trend reversed in 2000. Kim, Heshmati and Aoun (2006) investigated the leverage behaviour during the Asian financial crisis for Korea using an unbalanced panel data of listed firms. They reported that the crisis did have an impact on the optimal capital structure. Their findings suggest that chaebol-affiliated firms had higher optimal leverage level and adjusted their capital structure more quickly than non-chaebol firms. Similarly, Ariff, Taufiq, and Shamsher (2008) examined the capital structure factors and speed of adjustment to target debt ratios during the Asian financial

crisis. Using a large sample size from firms in Korea, Indonesia, Malaysia and Thailand for the period 1986-2001, they reported that financially distressed firms have substantially greater levels of debt ratio than the non-financially distressed firms do. Prior to 1997, the debt level of distressed firms was 0.167 and for healthy firms was 0.108. The debt ratio after the crisis was between 0.627 - 0.74 for distressed firms, while non-distressed firms had ratio between 0.35 - 0.423. In terms of the nature of debt, more short-term debt has been in distressed firms, a proportion of 0.509 - 0.669 compared to 0.30 for the non-distressed firms. In 2009, Deesomsak, Paudyal and Pescetto revisited the topic of capital structure during the 1997 crisis and focused on the debt maturity structure of four countries pre- and post-crisis and their speed of adjustment. Using the Generalized Method of Moments (GMM) regression method, they reported that firms in countries which were least affected by the Asian crisis had slower speed of capital structure adjustment, while firms in countries which were most affected by the crisis did not change their speed of adjustment.

Campello, Graham, and Harvey (2010) conducted a survey including 1,050 chief financial officers (CFO) of firms from the Asia, Europe and the US to test whether firms were credit constrained during the Global Financial Crisis (GFC). The findings implied that the managers had specific strategies to cope with the crisis. In addition, firms had to use internally generated funds, reduce dividend payment, or sell assets. To explain the effect of the credit crunch crisis of 2007-2008 on the capital structure decisions of the US firms, Fosberg (2012) analysed the data for the period 2001 to 2010. He reported that the market debt ratios of the sample firms increased by 5.5%. When the impact of the simultaneous recession was eliminated, results show that 5.1% of the debt accumulation was influenced by the financial crisis.

Zarebski and Dimovski (2012) examined the total leverage, long-term leverage and short-term leverage of the Australian Real Estate Investment Trusts during the period 2006-2009. They reported that the 2008 crisis had an impact on the mix of debt and equity of firms. The differences in cost between long-term and short-term debt seemed to result in substitution of one for another. After the crisis, the small companies appeared to increase their short-term debt and reduce their long-term. Zarebski and Dimovski (2012) emphasised two reasons for this strategy decision. First, it was expensive and difficult to obtain equity. Second, short-term

debts were quick to roll over, hence, reducing repayment and insolvency risk. In a recent study, Proença, Laureano and Laureano (2014) examined the impact of the 2008 credit crunch on the capital structure of Portuguese SMEs. They reported that the variable 'financial crisis' had a positive relationship with the leverage, indicating that the debt ratios appeared to fall after the financial crisis. The decrease in credit supply to SMEs after the fourth quarter of 2008 and the difficulties of accessing finance because of higher charges by banks were the main reasons.

The sovereign debt crisis started in 2010 when Greece announced its budget situation and confessed to reporting less than correct numbers, and was not able to meet its debt repayment requirements (Kanda & Iqbal, 2014). Following Greece, Spain, Portugal, Italy and Ireland announced the need for possible bailouts (Young & Semmler, 2011). The number of studies on the capital structure is relatively less in relation to for the sovereign debt crisis than for the other financial distresses. This is because the sovereign debt crisis is most recent and most of the researchers have focused on the causes, effects and solutions for the European Union (Lane, 2012).

Alves and Francisco (2013) found that during the debt crisis, firms mainly relied on short-term borrowing, because they faced greater exposure to rollover risk with lower credit rating and higher yield spreads. The effect of the crisis on leverage was stronger for firms from the US and from developed and highly financially liberalised countries than firms from Europe. According to Alves and Francisco (2013), this effect was different among European countries, with more effect on the peripheral countries such as Greece or Italy. The heterogeneous effect is explained by Neri, Ropele and d'Italia (2013) and Dailami (2010). They suggest that the 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. Kanda and Iqbal (2014) studied the relationship of the sovereign debt crisis and the capital structure of banks in the Eurozone. During the debt crisis, the weakening access of financing resources and the deteriorating value of sovereign debt assets urged the banks to deleverage by increasing their equity. The deleveraging of banks was due to the need to raise safety capital levels in response to the funding difficulties in the market and in

preparation for the new provision of the Basel III framework (Rixtel & Gasperini, 2013).

Based on above we, propose our first hypothesis as follows:

H1: European SMEs have adjusted their capital structure during the European sovereign debt crisis.

Determinants of capital structure

A plethora of studies exists relating the determinants of capital structure. For example, Frank and Goyal (2009) considered many factors that have potential to determine capital structure of the US firms; including firm, industry and country level factors. They reported that growth, tangible assets, profitability, size, industry median leverage and expected inflation have significant impact on the capital structure decisions of firms. Antoniou, Guney and Paudyal (2008) examined the drivers of capital structure of firms that traded on stock exchanges in the US, France, Germany, Japan, and the UK. Using the panel data and a two-step system-GMM regression method they reported that asset tangibility and size of firms had a positive impact on the leverage ratio, while the profitability, growth opportunities and share price performance had an inverse effect. In addition, the market conditions in which firms operate also affected the selection of the capital structure.

Hall, Hutchinson and Michaelas (2004) investigated the factors of long-term and short-term debt of SMEs in eight European countries. They only examined the firm-specific attributes because they consider the differences in firms' capital structures are not related to country or industry-specific factors. They reported that growth was the weakest factor and the asset structure had strongest explanation for capital structure decisions. However, their results are questionable as the regression results had very low R-squared and adjusted R-squared values and the sample included only 1995 data obtained from Dun and Bradstreet's survey. Benkraiem and Gurau (2013) collected data for French SMEs and used an Ordinary Least Squares (OLS) fixed-effect regression to measure the effect of corporate characteristics on firms' debt ratio. They examined five factors including size, profitability, growth, tangibility and volatility. The result for size

showed that French medium firms had more debt than small ones. Firm profitability had a negative relationship with total debt ratio, while the growth had a positive relationship with total debt ratio. The tangibility of asset was inversely related to leverage and the volatility did not significantly influence capital structure. Benkraiem and Gurau (2013) provided better understanding of the drivers of capital structure of French SMEs for the period 2003 - 2006.

Profitability is a source of funding for companies. According to the pecking order theory, firms with high profit will prefer to use their earnings and borrow less. Therefore, the profitability will have negative relationship with the debt ratio. This trend is confirmed by Chittenden et el., (1996), Adedeji (1998), Hall, Hutchinson and Michaelas (2004), and Antoniou, Guney and Paudyal (2008).

H2: Profitability has a negative relationship with the debt ratio.

Size have a negative relationship with the debt ratio. Large firms have more internal funding such as retained earnings and it is easy for them to get external funding, such as, stock issuance. To the contrary, SMEs find it more difficult to get access to external financing resources. SMEs lack reliable financial information to get equity funding from investors (Hall, Hutchinson, & Michaelas, 2004). Most of the researchers support that firms' size has significantly negative correlation with firms' debt ratio (Antoniou, Guney, & Paudyal, 2008; Benkraiem & Gurau, 2013; Hall, Hutchinson & Michaelas, 2004).

H3: Size has a negative relationship with debt ratio.

The relationship between asset tangibility and debt level is important in two ways. Fixed assets can be used as collateral - thus reduce the cost of borrowing. Hence, according to the trade-off theory, the value and quality of fixed assets will guarantee firms with loans from banks (Harris & Raviv, 1991). Alternatively, when firms want to expand, acquire new plant, property or equipment, this will motivate them to raise their capital. In both cases, the nature of assets has positive relationship with firms' leverage ratios (Antoniou, Guney, & Paudyal, 2008; De Jong, Kabir, & Nguyen, 2008; Hall, Hutchinson, & Michaelas, 2004).

H4: Asset nature has a positive relationship with debt ratio.

Firms' growth indicates the increasing level of funds needed for investment. When internal resources are insufficient, firms are required to raise funds from external debts. Apparently, there is a positive relationship between growth and leverage ratio (Cosh & Hughes, 1994; Michaelas, Chittenden, & Poutziouris, 1999). However, empirical evidence are contradictory. De Veirman and Levin (2012) investigated the case of Japanese firms and reported that companies which reduced their debt levels the most in the period 1991-1997 did not grow more quickly than firms in the recovery years 2003-2005. In addition, access to finance did not become systematically more difficult for weak firms, which indicated that the difficulty of access to finance might come from other factors such as macroeconomic factors rather than firm's growth rate. This negative relationship is also reported by Antoniou, Guney and Paudyal (2008) and Frank and Goyal (2009).

H5: Firm's growth has a negative relationship with debt ratio.

Volatility of earnings is the indication of business risk. De Veirman and Levin (2012) stated that the firms' volatility measured by the combined effect of change in sales, earnings and employment growth, due to change in macroeconomic conditions. High volatility in earning implies higher risk. The trade-off theory suggests that the company's high risk will lead to high probability of bankruptcy. According to Drobetz and Fix (2003), highly volatile firms take on less debt than low volatility ones. The pecking order theory predicts the same negative relationship between volatility and firms' debt ratios (DeAngelo & Masulis, 1980). The fluctuation in earnings of a company makes it difficult for investors to estimate future earnings. Hence, the asymmetric information tend to increase the cost of debt and also the ability of acquiring debt will fall for high volatility companies.

H6: Volatility has a negative relationship with debt ratio.

2.1.1 Industry-specific determinants of capital structure

As each industry has different characteristics, firm's debt ratio varies across industries. For example, the manufacturing industry requires considerable capital to invest in plant and equipment, while the financial services industry needs less investment in fixed assets. Flannery and Rangan (2006) used firm's lagged industry median debt ratio to control for industry characteristics not reflected through other variables in their target capital structure model. The coefficient of the industry factor was positive and statistically significant. Frank and Goyal (2009) documented that industry median leverage is one of the important elements that affects the capital structure decision. According to Frank and Goyal (2009) and Flannery and Rangan (2006), industry median leverage could influence the capital structure in two ways. First, managers used industry median leverage as one of the proxies for them to build their own mix of debt and equity. In addition, industry-specific drivers of capital structure have potential to capture the effects of omitted variables. Frank and Goyal (2009) found a positive relationship between debt ratio and the industry median leverage ratio, thus suggesting that firms that operate in industries in which have high median leverage tends to have high leverage. Their finding is consistent with that reported Flannery and Rangan (2006).

H7: Industry-specific factor has a positive relationship with debt ratio.

2.1.2 Country-specific determinants of capitals structure

The market conditions in each country provide the environment for equity or corporate bond issuance as well as access to bank loans. For example, in order for the corporate bond market to develop, there should be a stable macroeconomic environment such as a controlled financial deficit and low inflation rate (Reinstein, 2002). Choe et al. (1993) noted that during economic expansion, the issuance of equity rose, which explained the counter-cyclical increase in the adverse selection costs.

Jong, Kabir and Nguyen (2008) investigated the importance of country-specific drivers of capital structure and reported that the determinants in the country level had both direct and indirect impact on the capital structure decisions across 42

countries. Factors such as bond market development, credit right protection and GDP growth rate had significant direct effect on firms' capital structure. The statistically significantly positive relationship between GDP and debt level suggest that firms in countries with a high growth rate tends to use high 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. Jong, Kabir and Nguyen (2008) reported that firms in countries with more favourable legal environment and more stable and healthier economic conditions are less likely to increase their debt levels.

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 investigation of country-specific drivers of capital structure include 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 significant negative impact on firms' capital structure decisions. The higher inflation and improvement in the economy encouraged firms to use internal resources, lowering their leverage ratios. To the contrary, bank credit have a statistically significantly positive relationship with the capital structure mix of firms.

Alves and Francisco (2013) pooled a large amount of variables from 2000 to 2011 for 43 countries to study the impact of institutional effects on the capital structure choices during recent crises. The firm fixed effect approach was used to control for endogeneity. Similar to Bokpin (2009), Alves and Francisco (2013) reported the 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 increases firm's equity value, which caused the book debt ratio to fall. In terms of the government general gross debt, it had a positive influence on the long-term debt ratio and had a reverse effect on short-term debt ratio. Alves and Francisco (2013) documented that the recent increase in the government 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, deleveraging process should occur over the following years.

Frank and Goyal (2003) argue that only 30% of the capital structures are explained by firm-specific determinants. However, majority of the research have concentrated on the firm-specific determinants of capital structure. Based on the findings of Frank and Goyal, this study considers factors relating to the industry and country level variables, which include GDP growth, inflation and government debt ratio. Therefore, we propose the following hypotheses as stated below:

H8: GDP growth has a negative relationship with debt ratio.
H9: Government debt has a negative relationship with debt ratio.
H10: Inflation has a negative relationship with debt ratio.

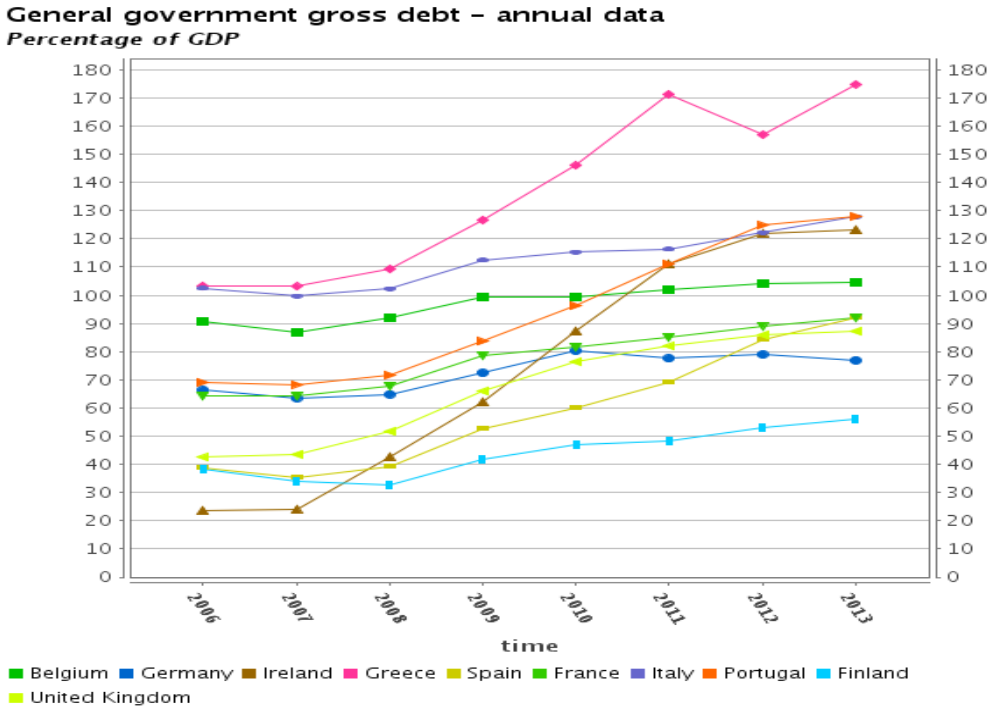
3 Data and Research Method

3.1 Data

As indicated in the previous sections, the European debt crisis began in 2010 when Greece announced its budget situation, confessed to reporting less than correct numbers, and was not able to meet its debt repayment requirements (Kanda and Iqbal, 2014). To investigate the effect of crisis on capital structure, data was collected for the period 2006 to 2013. The time span covers two sub-periods, that is, before the crisis period, which include 2006-2009, and after crisis period, which include 2010-2013. The two sub-periods allow to identify: (i) whether there is a change in the capital structure; and (ii) whether there is a change in the factors affecting the capital structure decisions during and after the crisis. This research focuses on the Eurozone countries including Belgium, Finland, France, Germany, Greece, Ireland, Italy, Portugal, Spain, and UK. Each country has different institutional and regulatory environment. With the aim of providing a comprehensive dimension on the analysis, the sample is divided into non-stressed economies including UK, France, Germany, Belgium and Finland. The remaining countries are considered stressed economies during the crisis. In 2010, the stressed countries such as Portugal, Spain, Greece, Italy and Ireland announced the need for possible bailouts (Young & Semmler, 2011) and in 2013;

four out of five countries had government debt level which were higher than 100% (see Figure 1 below).

Figure 1: Government debt to GDP (percentage)



(Source: Eurostat)

According to Figure 1, at the end of 2013, except for Spain, the group of stressed countries has the government debt level more than 100%. Greece is the country with the most serious situation of sovereign debt although the level drops in 2012, and Finland is the country with the lowest government debt to GDP percentage. Table 1 below demonstrates the distinction between stressed and non-stressed countries based on 10-year bond maturity rates in 10-sample countries. According to Table 1, all non-stressed countries have average 10-year bond yields around 2 - 3.5% and all stressed countries have the borrowing cost higher than 4.5%.

Our sample only includes non-financial SMEs because the financial institutions, for example, banks, insurance companies or funds have different regulatory rules.

Table 1: 10-year Yield (%)

Country	Non-stressed countries					Stressed countries				
Year	UK	France	Germany	Finland	Belgium	Greece	Spain	Ireland	Italy	Portugal
2010	3.36	3.12	2.74	3.01	3.46	9.09	4.25	5.74	4.04	5.40
2011	2.87	3.32	2.61	3.01	4.23	15.75	5.44	9.60	5.42	10.24
2012	1.74	2.54	1.50	1.89	3.00	22.50	5.85	6.17	5.49	10.55
2013	2.03	2.20	1.57	1.86	2.41	10.05	4.56	3.79	4.32	6.29
Average	2.50	2.79	2.1	2.44	3.28	14.35	5.02	6.33	4.82	8.12

(Source: European Central Bank database)

The data for the firm characteristics was collected from Thomson One database. Thomson One database also provided data for the leverage ratios. In terms of the macroeconomic data, the general gross government debt was collected from the Euro statistics website. The growth in GDP and the inflation was collected from the World Bank database.

Firms that did not have at least five years of available data over the sample period were excluded. According to De Jong et al. (2008), there is a trade-off between the number of countries that can be examined and the availability of enough firm-specific data. However, it is unavoidable that in some countries in the sample such as Spain, have a low number of firms compared to other countries. In order to minimize the impact of outliers, the data were winsorized at the 1st and 99th percentile. The final sample includes 2,248 firm-year observations for 306 firms.

3.2 Measurement of variables

The dependent variable, leverage ratio is measured by total debt divided by total assets. Although Myers (1984) suggested that book values are better proxies for the value of assets in place, others argue that the market value reflect more accurately the intrinsic value of the assets (Flannery & Rangan, 2006; Frank & Goyal, 2009). Based on above, both book value and market value of debt ratio will be used in this study. The total assets reported in the balance sheet for the year is used as the book value of total assets. The market value of total assets are

calculated by the sum of total liabilities and the market value of common equity, which equals the price per shares multiplied by the number of common shares outstanding. Following Booth et al. (2001), De Jong et al. (2008), and Hall et al. (2004), the long-term debt ratio measured by the total long-term debt to total assets will be used for robustness check. In addition, Welch (2012) note that using "debt-to-capital active" (DCA) is a good measurement for leverage changes because it takes out of the effect of corporate performance on changes and eliminates stock-market induced noise as well as biasness and irregularities of stock-market return. Therefore, DCA is also used for robustness test.

Table 2 reports the details regarding the variables, measurement method of variables used in this study. Dependent variables used in this study are similar to that used by Deesomsak, Paudyal and Pescetto (2004) and Frank and Goyal (2009). For the measurement of government debt, we have used a similar method to that used by Alves and Francisco (2013).

Table 2: Measurement of Variables

Dependent Variables	
Market Value of Total Debt Ratio (MV1)	Total Debt/Total Market Value of Assets
Book Value of Total Debt (BV1)	Total Debt/ Total Book Value of Totals
Market Value of Long-Term Debt (MV2)	Total Long-Term Debt/Total Market Value of Assets
Book Value of Long-Term Debt (BV2)	Total Long-Term Debt/Total Book Value of Assets
Debt-to-Capital (DCA)	$DCA_{t-1,t} = D_t/(D_t + E_t) - D_{t-1}/[D_{t-1} + E_{t-1} \cdot (1 + x_{t-1,t})]$
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 GPD
Government Debt (GOV_DEBT)	Gross Government Debt/GDP
Inflation (INFLA)	Percentage change in CPI

3.3 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 to analyse the data as Flannery and Rangan (2006) show 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 fixed effects OLS helps to bypass potential problems of endogeneity. The regression model for this study is given below:

$$D_{it} = \alpha + \beta D_{i,t-1} + \sum \beta_j X_{i,j,t} + \sum \gamma_k Z_{k,t} + \eta_i + v_t + u_{it} \quad (1)$$

where

D_{it} represents either market value of leverage or book value of leverage or market value of long-term debt or book value of long-term debt or debt-to-capital of firm i in year t. $D_{i,t-1}$ indicates one period lagged variable. $X_{i,j,t}$ is the firm level variables, such as, asset tangibility, profitability, firm size, firm growth, volatility of earnings, industry median leverage. $Z_{k,t}$ represents the kth macroeconomic variables, such as, GDP growth rate, government debt level, inflation. η_i indicates firm fixed effects, v_t indicates year fixed effects, u_{it} indicates the error term.

Similar to Flannery and Rangan (2006) and Ariff, Taufiq and Shamsher (2008), we have also used lagged one period of debt ratio to capture the speed of adjustment of the capital structure towards its target ratio in the context of the sovereign debt crisis. The speed of adjustment is calculated by one minus the coefficient of the lagged leverage ratio. The analysis is undertaken for the full sample, two sub-periods (which relate to before and during the crisis period), and two sub-groups of countries (which are stressed and non-stressed countries), to make a comprehensive comparison. Although this research concentrates on the market value of debt ratio, the book value of debt will also be analysed to identify the measure of leverage that is strongly affected by the factors. To check the reliability of the model, the robustness test is undertaken by using different proxies for the dependent variables, that is, long-term debt to total assets ratio and the debt-to-capital (DCA).

4 Results

4.1 Descriptive and trend analysis

Table 3 reports the descriptive statistics of the dependent and independent variables for the full sample, pre-crisis period, during crisis period, non-stressed countries and stressed countries. Results reported in Table 3 show that the market value of debt ratio is lower than the book value in most of the cases except for the group of stressed countries. In this group, the mean of market value of debt ratio and book value of total long-term debt is 0.322 and 0.146, respectively. However, the average book value of debt ratio is 0.316 and average market value of long-term debt is 0.142. In terms of the debt-to-capital, average is 2.019. In comparing the two periods (before and after crisis), the average book value of debt (BV1), the average market value of debt (MV1) and average debt-to-capital (DCA) are higher for the period 2010-2013 than 2006-2009. To the contrary, the mean market value of long-term debt (MV2) is 0.073, which is smaller for the post-crisis period compared to the pre-crisis period. The same trend applies for BV2. This indicates that during the crisis, the value or quantity of long-term debts used have declined. The standard deviations of the dependent variables in most cases are higher for the period 2010-2013 and also for the group of stressed countries than for the pre-crisis period and the group of non-stressed countries. For example, the fluctuation of market debt ratios for the group of stressed countries is 0.216 for market debt (MV1) and 0.155 for long-term market debt (MV2). It is interesting to note the standard deviation of book debt (BV1) is highest during the period of sovereign debt crisis.

In regards to firms' characteristics, the median of profitability are all positive. The median profit figures are quite low across the groups with the highest figure of 2.56% belonging to the stressed group of countries. However, mean of the profitability are all negative, indicating poor business performance of SMEs during the sample period. The worst loses are experienced during the crisis period compared to the pre-crisis period.

Firm size fell during the crisis period from an average of 3.986 in 2006-2009 to 3.863 in 2010-2013. The average size of firms in stressed countries is larger than in the 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 debt crisis

period and for the stressed countries compared to the pre-crisis period and the non-stressed countries. This result suggests that there has been an increase in the use of the fixed assets by SMEs. 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 2.639, the corresponding figure for the period 2010-2013 is about 1.5 times that of 2006-2009. In comparing two groups of countries, the non-stressed countries presents a higher mean growth value of 3.869 compared to the group of stressed countries, which is only 1.567. The results for volatility shows a consistent negative value in all the groups. The highest earnings fluctuation represents stressed countries.

In regards to the determinants of capital structure at the industry and country level, there are some noticeable observations. 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 recording higher average industry median leverage of 0.1686 compared to the non-stressed countries of 0.105. GDP growth rate decreased slightly from an average of 0.0044 during 2006-2009 to 0.004 in 2010-2013. In particular, the stressed countries have negative mean GDP growth rate of -1.57%, which implies that this group of countries' GDP 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 has an average ratio of sovereign debt of about 0.69, the stressed countries have a significantly higher ratio of 1.180. In addition, the stressed countries have the largest standard deviation for government debt. The mean inflation rate is slightly lower in the pre-crisis period and for the stressed countries. In summary, macroeconomic conditions are more favourable for non-stressed countries than stressed countries.

The correlation coefficient for variables reported in Table 34 show only dependent variables (MV1, MV2) having high correlations. The correlations for the independent variables are low, thus suggest that multicollinearity is not a major concern for this study.

Table 3: Summary Statistics

Category	Criteria	MV1	BV1	MV2	BV2	DCA	PROFIT	SIZE	TANG	GROW	VOL	IND_MED	GDP_GROW	GOV_DEBT	INFLA
2006-2013	Mean	0.1519	0.2016	0.0755	0.1048	0.3599	-0.0302	3.9246	0.1831	3.3953	-1.7565	0.1181	0.0042	0.7918	0.0246
	Median	0.0844	0.1158	0.0169	0.0208	0.0253	0.0140	3.8737	0.0587	1.2600	-0.1655	0.1143	0.0165	0.7640	0.0233
	Std Dev	0.1796	0.4773	0.1211	0.2293	17.9860	0.2163	1.2685	0.2750	36.470	41.3176	0.0856	0.0302	0.2985	0.0119
2006-2009	Mean	0.1490	0.1985	0.0780	0.1091	0.1220	-0.0289	3.9864	0.1666	2.6392	-1.5543	0.1314	0.0044	0.6500	0.0233
	Median	0.0857	0.1231	0.0200	0.0298	0.0027	0.0156	3.9293	0.0581	1.3200	-0.1357	0.1462	0.0130	0.6420	0.0232
	Std Dev	0.1713	0.2609	0.1219	0.2156	9.8320	0.2134	1.3163	0.2371	16.1941	40.2008	0.0807	0.0322	0.2336	0.0111
2010-2013	Mean	0.1548	0.2048	0.0730	0.1004	0.5977	-0.0315	3.8628	0.1997	4.1514	-1.9586	0.1048	0.0039	0.9337	0.0258
	Median	0.0824	0.1110	0.0109	0.0123	0.1102	0.0130	3.8169	0.0611	1.2050	-0.1968	0.0946	0.0165	0.8190	0.0255
	Std Dev	0.1876	0.6227	0.1202	0.2423	23.462	0.2192	1.2162	0.3075	48.9687	42.4204	0.0883	0.0280	0.2889	0.0125
Non-stressed countries	Mean	0.1078	0.1721	0.0572	0.0951	0.1484	-0.0401	3.7822	0.1310	3.8694	-1.1885	0.1049	0.0093	0.6912	0.0250
	Median	0.0511	0.0775	0.0055	0.0079	0.06185	0.0106	3.7371	0.0358	1.4300	-0.1618	0.0924	0.0165	0.7640	0.0233
	Std Dev	0.1383	0.5195	0.1029	0.2445	0.2704	0.2339	1.2676	0.2306	40.7902	36.6408	0.0817	0.0233	0.1596	0.0099
Stressed countries	Mean	0.3223	0.3157	0.1461	0.1419	2.0188	0.0082	4.4737	0.3842	1.5667	-3.9471	0.1686	-0.0157	1.1802	0.0231
	Median	0.3194	0.2917	0.0954	0.1085	0.8783	0.0256	4.3904	0.2777	0.7950	-0.1801	0.1770	-0.0193	1.1250	0.0290
	Std Dev	0.2156	0.2219	0.1553	0.1522	30.8319	0.1198	1.1138	0.3340	6.2810	55.7928	0.0816	0.0428	0.3806	0.0175

Table 4: Correlation Matrix

	MV1	MV2	BV1	BV2	DCA	PROFIT	SIZE	GROW	TANG	VO	INDUSTRY_MED	GDP_GROW	GOV_DEBT	INFLA
MV1	1.00													
MV2	0.75	1.00												
BV1	0.39	0.32	1.00											
BV2	0.43	0.64	0.69	1.00										
DCA	0.01	-0.00	0.00	0.00	1.00									
PROFIT	0.10	0.09	0.02	0.04	0.00	1.00								
SIZE	0.15	0.14	0.05	0.08	0.05	0.18	1.00							
GROW	0.00	0.03	-0.01	0.00	-0.00	-0.02	0.00	1.00						
TANG	0.42	0.36	0.05	0.07	0.09	-0.00	0.10	-0.04	1.00					
VOL	-0.04	-0.01	-0.01	-0.01	-0.00	0.04	-0.00	0.00	-0.05	1.00				
IND_MED	0.36	0.27	0.07	0.06	0.02	0.16	0.04	-0.02	0.22	-0.01	1.00			
GDP_GROW	-0.31	-0.17	-0.07	-0.04	-0.06	0.02	0.02	0.03	-0.21	0.04	-0.18	1.00		
GOV_DEBT	0.44	0.25	0.10	0.04	0.06	0.07	0.10	-0.01	0.37	- 0.03	0.15	-0.50	1.00	
INFLA_	-0.06	-0.05	-0.02	-0.03	0.01	-0.05	-0.09	-0.00	-0.00	-0.03	-0.08	0.22	-0.14	1.00

Figure 2 depicts the comparative book value and the market value of debt. The book value is consistently higher than the market value, which is consistent with the descriptive statistics. Figure 3 depicts the change in the average market debt ratio between two groups of countries during the sample period. The market debt ratio is consistently higher for the stressed countries than for the non-stressed countries. In the stressed countries, leverage increased during the period 2006-2012. The highest percentage change in debt ratio is during 2011, which is around 38% and 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 the 2009 to 13% in 2010. During the 2011 to 2013, 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 either have lowered or kept their market debt level unchanged.

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

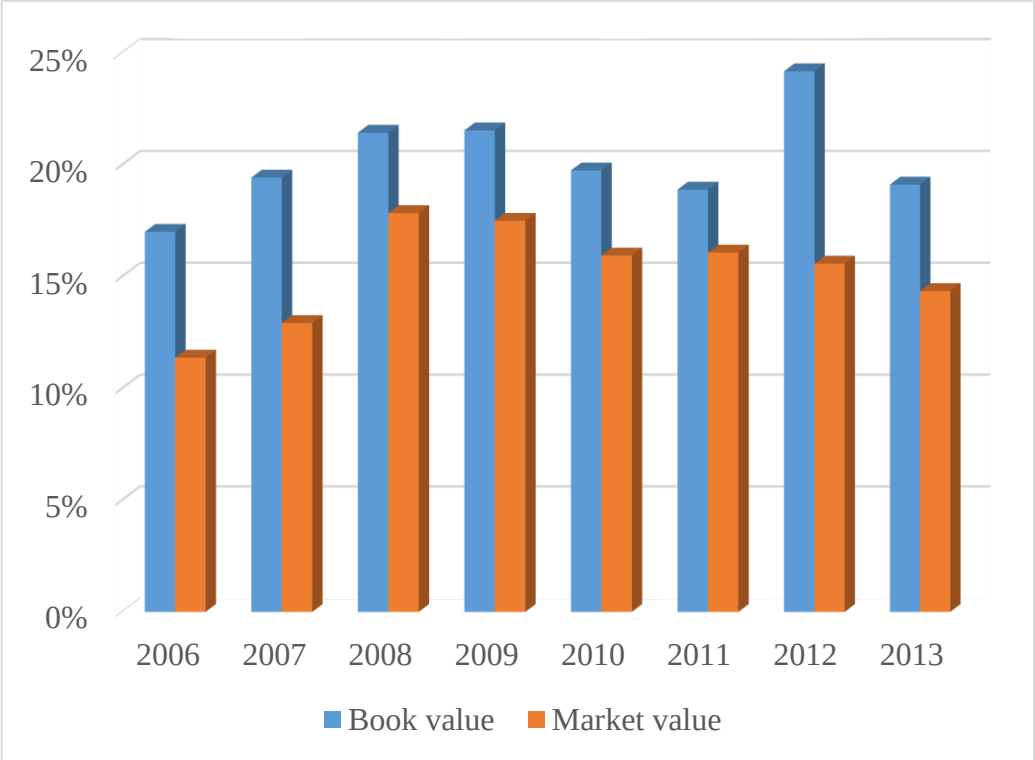
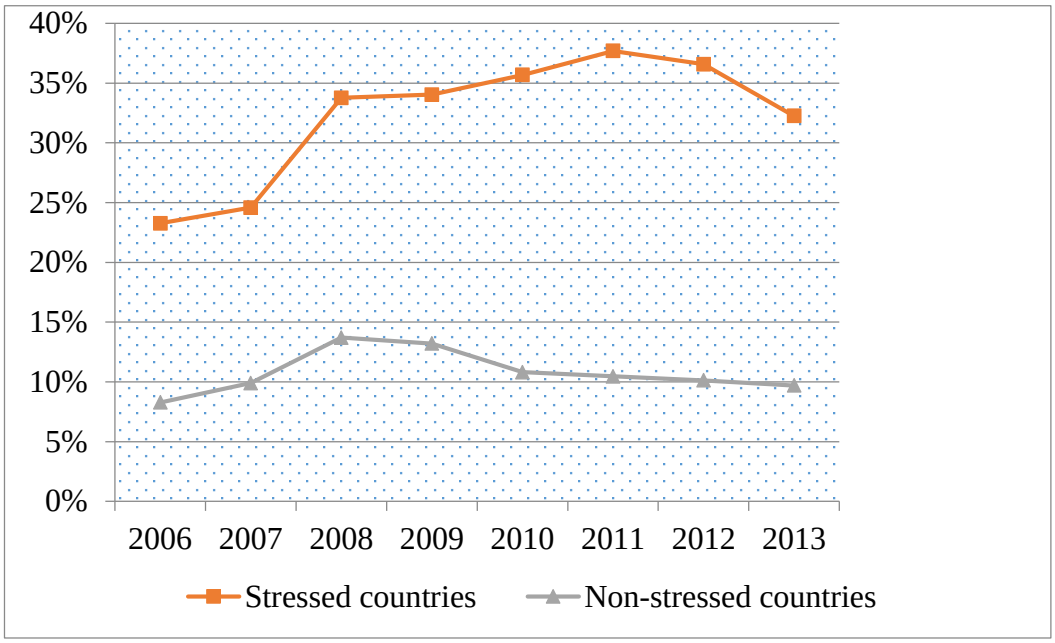


Figure 3: Market value of debt of two sub-groups of countries (2006 – 2013)



4.2 Regression Results

The regression analysis of the full sample for the period 2006-2013 is undertaken first. The second estimation period is the pre-crisis period, which is 2009-2009. The third time span examined is the crisis period, which include the period 2010 to 2013. To examine the effect of each crisis on country group, the sample is divided into stressed and non-stressed countries.

Table 5 reports the regression results for market value of total debt as the dependent variable. The lagged leverage ratio (MV1(-1) show a significant impact on the capital structure decisions for the results reported in columns 2 -6. The coefficient MV1(-1) in column 2 is 0.458, indicates that European SMEs have a speed of adjustment of approximately 0.54 (1-0.46). Hence, it takes SMEs approximately two years to close the gap between a typical firm's current and desired leverage ratios. Asset tangibility (TANG) shows a statistically significant positive relationship with the debt ratio at 1% level. The coefficient of PROFIT is only statistically significant for stressed countries, thus suggest that profitability had a negative effect on leverage. The coefficient of the GROW is positive and statistically significant for the overall sample suggest that as firm's growth is financed by borrowing. The coefficient of VOL is negative and statistically significant for the period 2010-2013, suggest that firms that have had high

volatility in earnings were not able borrow much during the crisis period. The industry factor has an important impact on the choice of capital structure. In columns 2 - 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. Growth in GDP (GDP_GROW) is negatively related to the market value of debt. The coefficient of GDP_GROW is statistically significant across columns 2 - 6. The government debt level has a negative effect on the behaviour of capital structure choice. This effect is statistically significant across columns 2 - 5 except for the column 6. The coefficient of inflation rate is significantly positive at 1% in all columns 2 - 6 apart from column 4.

The comparison between stressed and non-stressed countries show that non-stressed countries have slightly higher speed of capital adjustment at approximately 0.55 compared to the stressed countries of 0.54. Profitability has a statistically significant negative coefficient for the group of non-stressed countries and is no significant for stressed countries. Firm size is important in deciding the capital structure in non-stressed countries) and the signs of the coefficient is negative. Tangibility has a positive relationship in both stressed and non-stressed countries. This relation is statistically significant at 1% level. The industry median leverage is positively associated with the debt ratio in both group of countries. The coefficient of the GDP growth is statistically significantly negative for non-stressed countries, thus indicate growth in GDP have a negative effect on the debt ratio. Surprisingly, the government debt only has an important role in capital structure decisions in non-stressed countries. Inflation has positive a relationship with debt ratio both group of countries.

Table 5 reports the results for dependent variable book value of debt ratio (BV1). In regards to BV1, the results do not have a strong explanatory power as both, R^2 and adjusted R^2 are lower. Results reported in Table 5 for BV1 show that the independent variables are not statistically significant. The results for MV1(-1) is only significant for the period 2010-2013 and for the stressed countries.

Table 5: Fixed Effects OLS Regression Analysis

	MV1					BV1				
	2006-2013	**2006-2009**	**2010-2013**	**Non-Stressed Countries**	**Stressed Countries**	**2006-2013**	**2006-2009**	**2010-2013**	**Non-Stressed Countries**	**Stressed Countries**
Const.	**0.066†** **(0.035)**	**0.227***** **(0.000)**	**0.249***** **(0.068)**	**0.091**** **(0.032)**	-0.088 (0.172)	**0.266**** **(0129)**	**0.510**** **(0.158)**	0.164 (0.227)	**0.286†** **(0.161)**	-0.254 (0.206)
MV1(-1)	**0.458***** **(0.029)**	**0.111**** **(0.044)**	**0.102†** **(0.071)**	**0.448***** **(0.035)**	**0.458***** **(0.061)**	0.026 (0.062)	0.053 (0.087)	**-0.506***** **(0.027)**	0.019 (0.057)	**0.618***** **(0.066)**
PROFIT	-0.015 (0.014)	-0.015 (0.011)	-0.025 (0.020)	-0.005 (0.013)	**-0.142**** **(0.051)**	-0.025 (0.025)	0.032 (0.041)	0.012 (0.084)	-0.001 (0.024)	**-0.428** **(0.123)**
SIZE	-0.006 (0.015)	**-0.027***** **(0.008)**	0.001 (0.012)	**-0.010†** **(0.006)**	0.029 (0.031)	-0.018 (0.022)	**-0.047**** **(0.023)**	**0.110†** **(0.061)**	-0.027 (0.024)	0.073 (0.036)
TANG	**0.091***** **(0.039)**	**0.252***** **(0.056)**	0.046 (0.040)	**0.072**** **(0.035)**	**0.167**** **(0.073)**	-0.011 (0.033)	0.017 (0.057)	0.068 (0.058)	0.012 (0.033)	0.025 (0.062)
GROW	**0.001**** **(0.474)**	0.001 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.001 (0.002)	-0.000 (0.000)	-0.000 (0.000)	-0.001 (0.001)
VOL	-0.001 (0.000)	0.000 (0.000)	-0.001 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.002 ((0.000)	-0.000 (0.000)	-0.000 (0.000)
IND_MED	**0.289***** **(0.075)**	**0.361**** **(0.121)**	**0.240**** **(0.168)**	**0.256**** **(0.081)**	**0.387**** **(0.185)**	**0.234**** **(0.205)**	0.062 (0.272)	0.988 (1.470)	0.268 (0.275)	0.244 (0.262)
GDP_GROW	**-0.329***** **(0.080)**	**-0.540**** **(0.172)**	**-0.427**** **(0.215)**	**-0.193**** **(0.085)**	**-0.426**** **(0.157)**	**-0.197**** **(0.229)**	-0.496 (0.346)	-1.079 (1.699)	-0.033 (0.287)	-0.193 (0.241)
GOV_DEBT	**-0.033**** **(0.015)**	**-0.120†** **(0.067)**	**-0.164**** **(0.072)**	**-0.056**** **(0.019)**	-0.017 (0.025)	**-0.009**** **(0.081)**	-0.198 (0.131)	**-0.319**** **(0.146)**	-0.015 (0.153)	0.002 (0.045)
INFLA	**0.773***** **(0.162)**	**0.502**** **(0.218)**	0.223 (0.346)	**0.624**** **(0.212)**	**0.750***** **(0.233)**	**-0.611**** **(0.389)**	-0.420 (0.492)	**-3.313** **(3.538)**	-1.250 (0.895)	-0.055 (0.378)
F stats (P-Value)	52.23 (0.000)	16.39 (0.000)	4.07 (0.000)	37.13 (0.000)	19.36 (0.000)	1.74 (0.071)	1.75 (0.069)	14.33 (0.000)	2.17 (0.020)	17.93 (0.000)
R^2 (Within)/(Between)	0.74 (0.29)/(0.87)	0.21 (0.26)/(0.20)	0.65 (012)/(074)	0.62 (0.27)/(0.79)	0.64 (0.39)/(0.71)	0.025 (0.01)/(0.071)	0.01 (0.04)/(0.01)	0.07 (0.15)/(0.55)	0.07 (0.01)/(0.02)	0.59 (0.38)/(0.67)
N	2142	918	1224	1701	441	2142	918	1224	1701	441

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

4.3 Robustness check

To check the reliability of our results we have undertaken further regression analysis using different proxies of the dependent variable, that is, market value of long-term debt (MV2), book value of long-term debt (BV2), and debt-to-capital (DCA). The book and market value of long-term debt is similar to that used by Booth et al. (2001), Hall et al. (2004), and De Jong et al. (2008). These authors argue that short-term debt contains a large amount of trade credit. Hence, there is a completely different set of factors affecting short-term debt ratios, making it difficult to interpret the results. In addition, using debt-to-capital (DCA) is appropriate for leverage changes because it reduces the effect of changes in corporate performance, stock-market induced noise and biasness arising from stock-market return irregularities (Welch, 2012).

Table 6 report the results for the dependent variable MV2 and BV2 and Table 7 reports the results for the dependent variable DCA. The coefficient of the lagged debt ratio in column 2 is statistically significant at 1% level, thus indicating it is important. The coefficients of TANG, GROW, IND_MED, GOV_DEBT and INFLA are statistically significant. In addition, the signs of the coefficients are same as the results reported in Table 5. The regression results for PROFIT and VOL are not significant, thus suggest that it have no influence on the mix of debt and equity decisions. The coefficients of TANG, GROW, IND_MED, and INFLA are positive and have significant impacts capital structure decisions in columns (2) and (3). The results reported in columns 7 – 11 showing evidence of lagged variable being statistical significant for the capital structure decisions in SMEs.

Results for DCA as the dependent variable is reported in Table 7. Some consistent findings with previous regression results for the lagged variable. It is to be noted that the regressions for DCA has lowest R-squared and adjusted R-squared compared to results reported in Tables 5 and 6.

Table 6: Fixed Effects OLS Regression Analysis

	MV2					BV2				
	2006-2013	2006-2009	2010-2013	Non-Stressed Countries	Stressed Countries	2006-2013	2006-2009	2010-2013	Non-Stressed Countries	Stressed Countries
Const.	**0.057** **(0.029)**	**0.141** **(0.053)**	-0.074 (0.101)	**0.064** **(0.028)**	0.008 (0.113)	**0.231** **(0.111)**	**0.375** **(0.126)**	**0.031** **(0.113)**	**0.276** **(0.132)**	-0.016 (0.138)
MV1(-1)	**0.349***** **(0.045)**	**0.159**** **(0.059)**	-0.041 (0.092)	**0.368***** **(0.057)**	**0.315**** **(0.078)**	**0.301***** **(0.064)**	**0.085**** **(0.109)**	**-0.457†** **(0.283)**	**0.296***** **(0.069)**	**0.322***** **(0.081)**
PROFIT	-0.007 (0.011)	-0.019 (0.011)	-0.001 (0.010)	-0.007 (0.010)	-0.011 (0.067)	-0.017 (0.028)	-0.052 (0.058)	-0.006 (0.012)	-0.023 (0.031)	-0.023 (0.067)
SIZE	-0.007 (0.005)	-0.016 (0.007)	-0.005 (0.005)	-0.007 (0.005)	-0.006 (0.022)	-0.023 (0.017)	-0.033 (0.021)	0.011 (0.009)	-0.028 (0.020)	0.005 (0.023)
TANG	**0.045**** **(0.021)**	**0.120**** **(0.056)**	0.002 (0.017)	**0.045†** **(0.024)**	0.045 (0.044)	0.004 (0.016)	0.0001 (0.061)	-0.010 (0.016)	0.015 (0.021)	-0.028 (0.315)
GROW	**0.045***** **(0.000)**	**0.001***** **(0.000)**	**0.001***** **(0.000)**	**0.000***** **(0.000)**	0.002 (0.000)	0.000 (0.000)	0.001 (0.001)	0.001 (0.000)	0.000 (0.000)	0.002 (0.001)
VOL	0.000 (0.000)	0.000 (0.000)	**0.002**** **(0.000)**	0.000 (0.000)	0.000 (0.000)	0.000 (0.160)	-0.003 (0.000)	**0.001**** **(0.000)**	0.000 (0.000)	-0.000 (0.000)
IND_MED	**0.250***** **(0.077)**	**0.282**** **(0.102)**	0.133 (0.151)	**0.175**** **(0.073)**	**0.636**** **(0.215)**	0.097 (0.487)	-0.030 (0.233)	-0.499 (0.377)	-0.021 (0.199)	**0.696**** **(0.256)**
GOV_GROW	-0.029 (0.082)	-0.237 (0.155)	-0.143 (0.244)	-0.028 (0.068)	0.042 (0.221)	0.106 (0.150)	-0.298 (0.256)	0.054 (0.428)	0.231 (0.206)	0.072 (0.249)
GOV_DEBT	**-0.031**** **(0.015)**	**-0.105†** **(0.057)**	0.136 (0.086)	**-0.034**** **(0.015)**	-0.010 (0.032)	**-0.078**** **(0.039)**	-0.162 (0.109)	0.096 (0.091)	-0.095 (0.068)	-0.017 (0.039)
INFLA	**0.327**** **(0.029)**	0.194 (0.178)	**0.868†** **(0.469)**	0.121 (0.167)	**0.490†** **(0.318)**	-0.499 (0.314)	-0.317 (0.371)	**1.181**** **(0.638)**	-1.252 (0.554)	0.124† (0.404)
F stats (P-Value)	15.24 (0.000)	13.76 (0.000)	8.08 (0.000)	11.62 (0.000)	4.90 (0.000)	5.81 (0.000)	5.62 (0.000)	2.09 (0.025)	6.33 (0.000)	7.12 (0.000)
R^2 Within/between	0.52 (0.16)/(0.74)	0.50 (0.15)/(0.69)	0.28 (0.04)/(0.42)	0.52 (0.17/(0.76)	0.39 (0.14)/(0.54)	0.35 (0.09)/(0.64)	0.27 (0.10)/(0.43)	0.42 (0.21)/(0.76)	0.39 (0.10)/(0.69)	0.29 (0.18)/(0.37)
N	2142	918	1224	1701	441	2448	918	1224	1701	441

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

Table 7: Regression Analysis of Debt-to-Capital as Dependent Variable

	2006-2013	2006-2009	2010-2013	Non-Stressed Countries	Stressed Countries
Const.	-0.743 (3.722)	0.171 (3.84)	0.494 (0.203)	0.086 (0.373)	8.829 (1.846)
DCA(-1)	**-0.l65***** **(0.005)**	**-0.493***** **(0.008)**	**-0.491***** **(0.008)**	**-0.158***** **(0.008)**	**-0.158***** **(0.009)**
PROFIT	-0.397 (0.862)	-2.595 (0.162)	2.266 (0.579)	-1.258 (0.451)	-3.839 (4.142)
SIZE	**0.813**** **(0.204)**	**0.797**** **(0.026)**	-0.192 (0.932)	1.161 (0.105)	2.345 (3.901)
TANG	8.972 (0.005)	6.374 (3.325)	**12.096** **(0.023)**	-0.642 (0.801)	7.883 (3.996)
GROW	-0.002 (0.987)	-0.003 (0.869)	-0.002 (0.970)	-0.0001 (0.931)	-0.093 (0.085)
VOL	-0.001 (0.955)	-0.002 (0.838)	-0.005 (0.798)	-0.0003 (0.973)	-0.005 (0.005)
IND_MED	7.357 (0.358)	6.096 (0.071)	41.698 (0.382)	5.070 (0.723)	4.243 (6.032)
GOV_GROW	4.355 (0.065)	12.871 (0.542)	-14.339 (0.035)	3.208 (0.847)	-5.058 (4.716)
GOV_DEBT	1.010 (0.751)	14.739 (0.938)	17.654 (0.213)	1.672 (1.900)	5.0587 (4.716)
INFLA	-11.856 (0.427)	-8.612 (0.788)	-4.730 (0.616)	-6.191 (0.301)	-6.703 (5.433)
F stats (P-Value)	3117.5 (0.000)	2336.56 (0.000)	367.71 (0.000)	488.27 (0.000)	366.38 (0.000)
R^2 (Adj. R^2)	0.10 (0.03)/(0.26)	0.01 (0.25)/(0.48)	0.05 (0.27)/(0.22)	0.01 (0.03)/(0.20)	0.03 (0.07)/(0.42)
N	2142	918	1224	1701	441

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

4.4 Discussion

First, in comparisons between the results for the market value and book value of debt, the results for the market value have stronger explanatory power. This indicates the effectiveness of using total market value of debt as a measurement of leverage. According to Flannery and Rangan (2006), Frank and Goyal (2009) and Fosberg (2012), the market value reflects much more accurately the current value of debt as well as the effect of the factors other than firms' characteristics on the decisions regarding capital structure. In this regard, the discussion of results will focus on the results of the market value of debt (MV1).

Second, results for the lagged debt ratio indicate that it is important in determining the firms' capital structure. Our results are consistent with Flannery and Rangan (2006) and Ariff, Taufiq and Shamsher (2008). The results from trend analysis and from the regression analysis indicate that European SMEs did adjust their capital structure during the period examined. While SMEs from non-stressed countries tend to reduce their leverage, the leverage of SMEs from stressed countries have increased during the sovereign debt crisis period. The coefficient of the variable lagged debt ratio suggests that SMEs in the non-stressed countries change their capital structure more quickly. The results also suggest the cost of adjustment for firms in stressed countries are higher than in non-stressed countries. Our results are consistent with the prior studies relating to a single country individual country that the speed of adjustment is higher for non-stressed countries. For example, the speed is 72% for French firms, 47% for German firms (Kremp et al., 1999), 43% for UK (Ozkan, 2001), and 21% for companies in Spain (Miguel & Pindado, 2001).

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, which have high amount of fixed assets, use more debt to finance. In addition, the more fixed assets SMEs have, the more willing banks are to give loan as SMEs have reliable resources to pledge as collateral or guarantee against borrowings. The evidence from TANG is consistent with 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 which 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, capital structure will be negatively influenced by firms' earnings volatility. However, Benkraiem and Gurau (2013) examined the case of French SMEs and reported insignificant impact of volatility. The results indicate that both firm's growth and volatility have weak explanatory power to be considered for the capital structure decisions of European SMEs during the government debt crisis.

Profitability is an important determinant of capital structure during the non-crisis period from 2006-2009 (Table 6) and for SMEs in stressed companies (Table 5). This can be interpreted as follows, that is, as the profitability continue to deteriorate, its fluctuation has more significant impact on capital structure decisions of stressed firms compared to the non-stressed firms. The negative coefficient of profitability suggest that more profitable firm 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 has a significant impact on debt for the pre-crisis period and for the SMEs in non-stressed countries. The relationship is negative which 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 lower cost of debt and lower risk of default. However, our findings for SIZE are similar to that reported Kremp et al. (1999) and Rajan and Zingales (1995) who 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 significantly positive coefficient indicates that SMEs use industry leverage as the benchmark to build capital structure. Hence, it can be concluded that SMEs' capital structure will move in the same direction to 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 statistically significantly negatively correlated to the debt ratio. According to Bokpin (2009), high GDP growth stimulates firms' business operations, which enables to increase the level of retained earnings and therefore, internal funding resources increase for firms.

Government debt level (GOV_DEBT) shows important implication for the choice of capital structure during both periods of pre-crisis and during crisis. The higher the government debt levels are, lower the firm's leverage is. Difficulty of a government's situation makes it 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 the government debt ratio to their determinants of capital structure model. Alves and Francisco (2013) claimed first to analyse gross government debt in relation to firms' capital structure. Although they found the positive relationship between government debt and long-term debt level, they also found the 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 firm's debt. Therefore, the regression results relating to government debt level in this paper is consistent with prior studies. .

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

5 Summary and conclusion

Capital structure is fundamentally the mix of debt and equity that managers have to make strategic decisions on to enhance shareholders' value. Hence, capital structure is considered one of the most important components in firms' operation.. During recent decades following the introduction of Modigliani-Miller theory, the number of studies on capital structure, especially its determinants, has significantly increased. This study has addressed three main gaps and contributed to the current literature on capital structure. Firstly, most of previous papers focus on the determinants of capital structure of large corporations. This study fills the gaps by investigating the case of SMEs. Secondly, there is less studies on industry and macroeconomic factors compared to the firm-specific determinants of capital structure. This paper conducts a comprehensive analysis with the combination of the determinants of capital structure at three levels, including firm, industry and country level. Lastly, the sovereign debt crisis provided an opportunity to investigate whether SMEs adjust their capital structure and whether the factors affecting the capital structure decisions change before and during the crisis.

The study examines SMEs in ten European countries, which were divided into two groups of non-stressed and stressed countries. The non-stressed countries include strong economies such as UK, Germany, France, Belgium and Finland. The other group has weaker economies such as Greece, Italy, Portugal, Ireland and Spain. The period examined is from 2006 to 2013, which includes both the pre-crisis and during crisis period. Fixed effects OLS regressions was undertaken for the independent variables on three levels: firm's characteristics, industry-specific and country-specific factors. The trend analysis and lagged debt ratio were included to test for the capital structure adjustment of SMEs.

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 stressed countries. While SMEs from non-stressed countries tended to reduce their leverage ratio, the ratios of SMEs from stressed countries increased under the sovereign debt crisis. The model with market value of debt has stronger explanatory power than the model with book value of debt. In terms of the determinants of capital structure, nature of assets, industry median leverage and

growth in GDP constantly had important effects on capital structure decisions. While tangibility and industry factor had positive relationships with firms' leverage ratio, growth in GDP demonstrated a negative relationship. Conversely, firms' growth and volatility did not show significant impacts on the choice of European SMEs' capital structure. The remaining factors have mixed results. Profitability became an important determinant of capital structure during the crisis period from 2010-2013 and for SMEs in stressed countries. In contrast to profitability, size demonstrated a significant impact for the pre-crisis period and for the group of SMEs in non-stressed countries. Government debt level showed important implication for the choice of capital structure during both periods pre-crisis and during crisis. Inflation was positively related to the leverage ratio in both groups of countries and for the model of total sample and for pre-crisis period. It can be concluded that not only firm's characteristics but industry factors and country-specific factors also have important roles in determining firms' capital structures.

The findings of this study has policy implications, that is, European countries and the European Commission should implement appropriate policy to ease the financial difficulties and help boost the performance of SMEs in the economy.

Finally, we caution the readers from generalising the findings of this study as our sample size is small and also study is based only on the sovereign debt crisis.

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